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Admissibility Criteria

The Reliability and Credibility of Using Satellite-Imagery to Document Evidence in Proceedings before the International Criminal Court

SEHR

Bas Jacobs

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List of Abbreviations and Acronyms

EO	Earth Observation/Satellite Imagery/Remote-Sensing Technology
UN	United Nations
UNGA	United Nations General Assembly
ESA	European Space Agency
ICC	International Criminal Court
OTP	Office of the Prosecutor
ICTR	International Criminal Tribunal for Rwanda
ICTY	International Criminal Tribunal for the former Yugoslavia
ECtHR	European Court of Human Rights
ECHR	European Convention of Human Rights
AC	Appeals Chamber
TC	Trials Chamber
PTC I	Pre-Trial Chamber I
PTC II	Pre-Trial Chamber II
PTC III	Pre-Trial Chamber III
RPE	Rules of Procedure and Evidence
OTP	Office of the Prosecutor
VCLT	Vienna Convention on the Law of Treaties
ECHR	European Convention of Human Rights
ECtHR	European Court of Human Rights
CJEU	Court of Justice of the European Union
ICCPR	International Covenant on Civil and Political Rights
UNHCR	United Nations High Commissioner for Refugee
SSP	Satellite Sentinel Project
PII	Personally Identifiable Information
DDE	Digitally Derived Evidence

Authored by Bas Jacobs[1]

Chapter 1: Introduction

1.1 Background

When investigating the most serious crimes of concern to the international community, the International Criminal Court (hereafter 'ICC' or 'Court') and especially the Office of the Prosecutor (OTP) generally employ a non-exhaustive list of 'classical' investigative methods to uncover the truth about an alleged crime and who is most responsible. It includes means as wide-ranging as inspecting the location where the alleged crime occurred, exhuming mass graves, interviewing witnesses, and collecting evidence like cell phone data, radio intercepts, videos, and photographs. In addition to these conventional investigative methods, and owing to the commercialization of the space industry, the ICC has also recently gained access to a relatively new means of collecting evidence — through remote-sensing technology.[2]

Remote-sensing, otherwise known as Earth Observation, is the science of extracting information about a specified area by analysing data acquired by a sensor/satellite in low, medium, or high-earth orbit.[3] For cases falling within the mandate of the ICC, the value of Earth Observation is that it provides the OTP with before and after evidence of, *inter alia,* the destruction of properties, attacks against civilian objects, and the bombarding of buildings that are not military objectives. For example, the ICTY Prosecutor in *Blagojević and Jokić* relied on the satellite images in Figure Figure 1. New Mass Burial Sites Following Srebrenica Massacre. to prove to the Trial Chamber that the Defendant had attempted to move a mass burial site to a secondary location following the Srebrenica massacre in 1999.[4]

[1] Bas Jacobs, Leiden University alumni of the LL. M in Public International Law and Advanced LL. M in Air and Space Law, currently based in the Director General's Cabinet at the European Space Agency in Paris, France. Email: Bas-jacobs28@hotmail.com
[2] Robin Pierro, *Satellite Imagery for Human Rights Monitoring* (2022) 1.
[3] UNGA, *Principles Relating to Remote Sensing of the Earth* (1987) 53.
[4] Prosecutor v. Vidoje Blagojević and Dragan Jokić (Trial Judgment) IT-02-60-T (17 January 2005) 382.

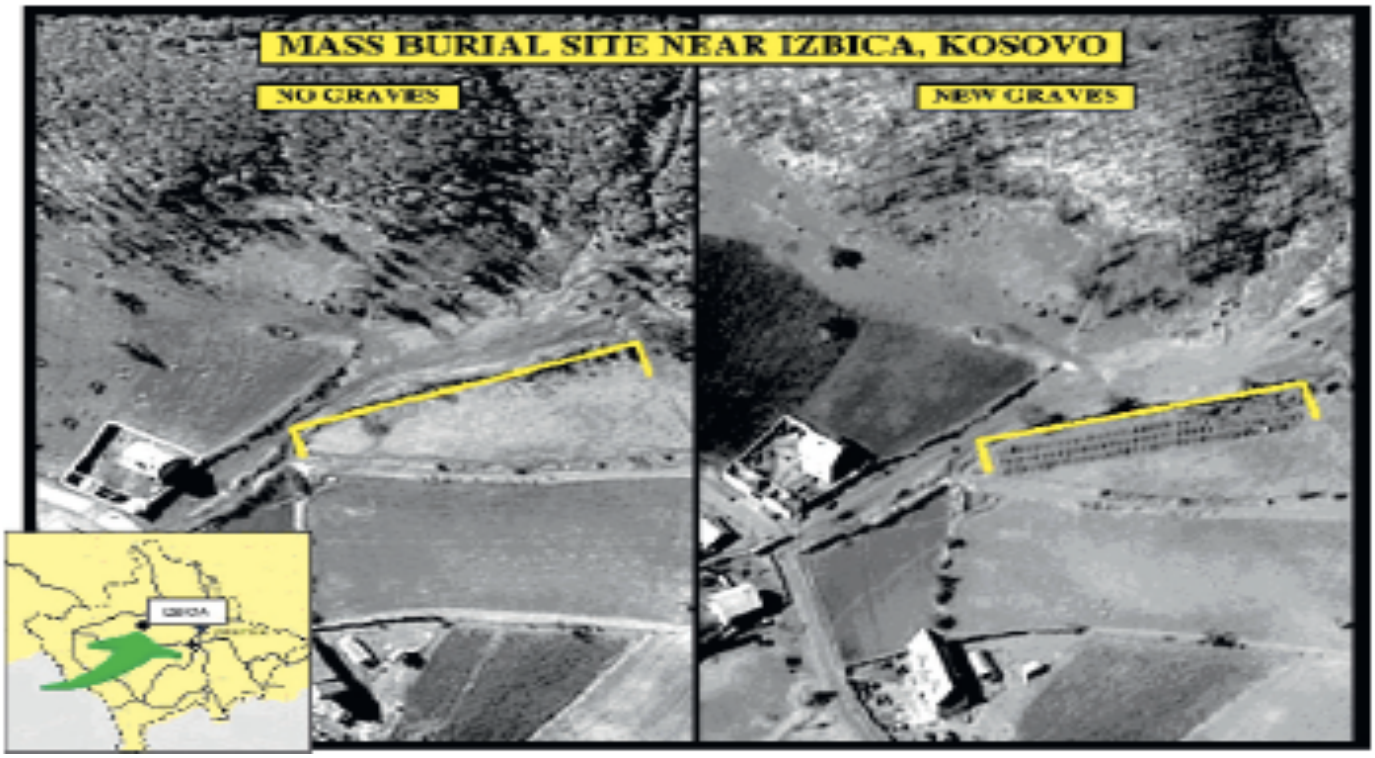

Figure 1. New Mass Burial Sites Following Srebrenica Massacre.[5]

From an evidentiary weight point of view, there are four critical stages to the OTP's use of satellite imagery as evidence in proceedings before the ICC:

- ◊ **Stage 1: Creation →** Spaced-based satellites collect raw data that is transmitted to a ground station and processed into an image based on pre-defined specifications.[6]
- ◊ **Stage 2: Transmission →** After a remote-sensing firm creates the image, the data is transferred to the storage system of the Court.[7]
- ◊ **Stage 3: Storage →** Before the Parties present the image to the Court, the geospatial data is securely stored.[8]
- ◊ **Stage 4: Interpretation →** For the image to be usable in Court, a forensic expert interprets the image and converts the data into a comprehensible document for the judges.[9]

[5] Purdy and Leung, *Evidence from Earth Observation Satellites* (2012) 225.
[6] Ginzky, *Satellite Images as Evidence in Legal Proceedings Relating to the Environment* (2000) 115.
[7] Ibid.
[8] Ibid.
[9] Ibid., 116.

When used in the context of judicial proceedings, the use of space-derived Earth Observation has, according to a joint publication by the London Institute of Law and Policy and the European Space Agency, three important evidential qualities:[10]

1. The information it collects is based on digital data that a person without special training cannot easily connect to the actual event.[11] Ensuring the reliability and credibility of the information will, therefore, require "ground truth" corroboration, i.e., witness interviews, site visits, etc;
2. The data must go through processing before a provider can convert it into an understandable document/image. It is the processed information, not the data initially collected, that is presented as evidence.[12] Consequently, the presentation of Earth Observation information to the Court will generally require the testimony of a person with specific expertise, which is why a court may classify this evidence as 'hearsay;' [13]
3. The collection, transmission, storage, processing, and dissemination of Earth Observation information creates an electronic record. The electronic nature of this evidence presents additional evidentiary considerations for the Court when assessing the evidence's admissibility and probative value.[14]

Recognition among humanitarian actors of the benefits of using Earth Observation for documenting mass atrocities happened at an unprecedented rate over the last decade.[15] This trend is attributed to an urgent demand for safer methods to gather information in conflict situations involving large-scale human displacement and frequent targeting of humanitarian personnel.[16] Obtaining credible and reliable information through human intelligence on the ground is often limited in crisis situations where access is restricted, and time is critical.[17] Instead, geohumanitarian action, meaning the integrated usage of Earth Observation into the

[10] Kay and Others, *Evidence from Space Study for the European Space Agency on Use of Space-Derived Earth Observation* (2012) 17.
[11] Ibid.
[12] Ibid., 17.
[13] Ibid.
[14] Ibid.
[15] Lang and Others, *Earth Observation Tools and Services to Increase the Effectiveness of Humanitarian Assistance* (2020) 68.
[16] Lichtman and Others, *Humanitarian Uses of Drones and Satellite Imagery Analysis* (2015) 1.
[17] Ibid.

operational planning and deployment of aid, has become the more normative approach for NGOs and UN fact-finding missions when entering high-risk conflict zones.[18]

Whereas a decade ago, private actors still only had access to low-resolution images (showing objects larger than 30 meters), today, any individual can purchase high-resolution geospatial data (showing objects under two meters in size) from a range of remote-sensing firms at a competitive price.[19] As a result, humanitarian agencies see Earth Observation as an indispensable means to capture non-distorted and non-manipulated data consistently over large areas under similar conditions.[20] Since 2012, Human Rights Watch and Amnesty International have demonstrated their confidence in the reliability and credibility of remote-sensing technology by submitting as 'evidence' to the ICC satellite images of widespread fire-related destruction in Rohingya villages, people fleeing conflict zones in Northern Nigeria, mass graves in Afghanistan, and the destruction of agricultural land in Syria.[21]

Similar to how Earth Observation complements humanitarian missions, it can also be convenient for the OTP's investigations, which operate in comparable high-risk, time-sensitive conditions.[22] As an international organization independent of the United Nations system, the Court lacks enforcement power and is mainly dependent on State cooperation to gather evidence.[23] This means that when States refuse to cooperate, the Court loses access to the location where the incidents under investigation took place, and even when State cooperation is not an issue, the process of requesting the required information may still be arduous and slow due to cumbersome bureaucratic procedures.[24] Consequently, the ICC risks replicating the outcome of *Prosecutor v. Ngudjolo* and acquitting (alleged) perpetrators on the grounds of insufficient evidence.[25]

In the case of space-based Earth Observation, however, the OTP is not restricted by the territorial sovereignty of the respective State insofar as space is not subject to national

[18] Kay (n 10) 17.
[19] Pierro (n 2) 1.
[20] Kay (n 10) 17.
[21] Amnesty International, *The Story Behind the Nigeria Satellite Images* (2015) 1.
[22] Sandalinas, *Satellite Imagery and Its Use as Evidence in the Proceedings of the ICC* (2015) 668.
[23] Ibid., 667.
[24] Ibid.
[25] The Prosecutor v. Mathieu Ngudjolo (Judgment Pursuant to Article 74) ICC-01/04-02/12 (18 December 2012) 197.

appropriation by claims of sovereignty or other means.[26] Therefore, the true value of Earth Observation is that it allows the Court to remotely and independently collect intel contemporaneously as events occur and, thereby, document the widespread, systematic character and long-term extent of reported violence.[27] Those aspects can be indispensable to the ICC, particularly for gathering information in the early stages of an investigation.

At this point, it is important to acknowledge that using space-derived Earth Observation to prove relevant facts in a case raises several questions, especially regarding its reliability and credibility. In its classical meaning, "credibility refers to believability or trustworthiness of the information", and "reliability refers to the ability to perform consistently, dependably, or as expected."[28] In relation to testimonial evidence, this means assessing the "credibility of the witness" and the "reliability of his or her testimony."[29] A witness might lose credibility depending on their relation to the accused, and a witness' testimony may become unreliable if the information was obtained through torture or other illegitimate means of interrogation.[30]

Regarding Earth Observation, various factors can impact its credibility and reliability. Indeed, a significant concern is that satellite images constitute electronically collected data.[31] This quality makes it a substantially different from photographs or videos.[32] Since satellite images are a culmination of data, research shows that it is almost impossible to prove if malicious actors made any alterations.[33] Therefore, the credibility and reliability of satellite imagery will heavily depend on the forensic standards and methodologies used when analysing the data and how the information is stored and protected from tampering and corruption.[34]

Additionally, even if the information is analysed and stored in a manner that leaves room for minimal human error, there is also the problem that judges must rely on experts' opinions to interpret the images on their behalf.[35] This raises additional concerns about the independence

[26] Outer Space Treaty (1966) article 2.
[27] Lang (n 15) 68.
[28] OHCHR, *Berkeley Protocol on Digital Open-Source Investigations* (2020) 18.
[29] Ibid.
[30] Ibid,
[31] Nuñez, *Admissibility of Remote Sensing Evidence Before International and Regional Tribunals* (2012) 4.
[32] Ibid.
[33] Ibid.
[34] Ibid.
[35] Kay (n 10) 17.

and impartiality of the expert and the national, political, or religious affiliation of the remote sensing firm that collects the data.[36]

As the use of Earth Observation to document mass atrocities is a relatively new trend, the legal instruments of the ICC do not yet pose any specific rules on the collection of geospatial data, nor any criteria or standards for assessing its reliability or credibility.[37] Consequently, the still-nascent legal precedents form a significant barrier to the more frequent submission of this type of evidence to the Court and its more effective use by the OTP.[38]

Indeed, clarification is needed on what factors affect the reliability and credibility of Earth Observation and how these reliability and credibility standards subsequently impact the admissibility and probative value of satellite imagery as evidence of criminal responsibility under the Rome Statute. To-date, there exists minimal case law from which to derive a general rule, and the ICC has never explicitly addressed the issue.[39] In fact, as of 2022, the primary support for Earth Observation as a legally valid form of evidence at the ICC is its admittance by the Trial Chamber in *Prosecutor v. Al Mahdi.*[40] In this case, following an accepted admission of guilt by the accused, the Trial Chamber stated that it would consider the relevance, probative value, and potential prejudice of the satellite-based evidence.[41] However, the Chambers did not elaborate on these considerations in the final judgement, leaving considerable uncertainty and ambiguity around how the Chamber assesses the reliability and credibility of satellite-imagery.[42]

Generally, it should be borne in mind that the Trial Chambers have the authority to freely assess the relevance or admissibility of all evidence submitted to it.[43] Nevertheless, the OTP already has to make an initial evaluation of the evidence's reliability and credibility during the investigative stage of the proceedings.[44] Indeed, it is the responsibility of the OTP to investigate

[36] Kay (n 10) 17.
[37] Ibid.
[38] Kroker, *Satellite Imagery as Evidence for International Crime*s (2015) 2.
[39] Ibid.
[40] The Prosecutor v. Admad Al Faqi Al Mahdi (Transcript Trial Hearing) ICC-01/12-01/15-T-4-Red-ENG (22 August 2016) 41.
[41] Ibid.
[42] Ibid.
[43] Rules of Procedure and Evidence, Rule 63.
[44] Rome Statute of the International Criminal Court (1 July 2001) article 53(1).

both sides of the case equally and decide if the evidence shows a 'reasonable' basis for proceeding under the Statute.[45]

Therefore, before the OTP refers a claim to the Pre-Trial Chamber, and in the interest of fair trial rights, it is standard procedure to meticulously evaluate the evidence.[46] Although article 54 does not explicitly state that the Prosecutor must assess reliability and credibility, it does set out the Prosecutor's duty "to establish the truth."[47] In a study examining the Rome Statute's travaux préparatoires this concept was interpreted as requiring the Prosecutor to be as comprehensive as necessary when initially evaluating the information and establishing whether criminal responsibility exists."[48] Therefore, for the OTP to investigate in a manner that respects the rights of the accused, it must make a critical assessment of the evidence's reliability and credibility.

For the evidence collected by conventional methods at the investigative stage of the proceedings, it has already been established that the OTP must make an initial assessment. However, suppose that the OTP will start using remote-sensing technology for documenting and investigating human atrocities. In that case, there is a need for more legal clarity about the reliability and credibility of satellite imagery as evidence of criminal responsibility under the ICC Rome Statute.

[45] Triffterer and Ambos, *Rome Statute of the ICC Article-by-Article Commentary* (2021) 1716.
[46] Ibid.
[47] Rome Statute (n 44) article 53(1).
[48] Triffterer and Ambos (n 45) 1716.

1.2 Purpose and Research Question

The purpose of this thesis is to analyse whether 'imagery' documented using Earth Observation is admissible in proceedings before the International Criminal Court and, in case so, what factors the Trial Chamber, and especially the OTP, must assess in its determination of the reliability and credibility of satellite imagery as evidence of criminal responsibility under the Rome Statute, particularly during the investigative stage of the proceedings. To perform this analysis, this Paper will inquire into the applicable procedural rules concerning the admittance of evidence under the Rome Statute and the Rules of Procedure and Evidence, as well as general case-law dealing with the reliability and credibility of other types of evidence. We will then transfer these findings to the use of satellite imagery as evidence before the Court.

It was discussed earlier, in *Section* ***Background***, that the use of remote-sensing technology at the ICC is an unexplored field of international criminal procedure. Considering that the ICC has not yet formed legal precedents for determining the reliability and credibility of satellite imagery, this Paper's research attempts to make an original contribution to the discourse on the topic.

It is, however, worth acknowledging that the drafters of the Rome Statute deliberately did not provide a fixed reliability and credibility standard.[49] Instead, the Rules of Procedure and Evidence leave it up to the Chambers to freely assess "all evidence submitted in order to determine its relevance or admissibility."[50]Also, in performing its functions prior to the trial or during the course of a trial, the Chambers always reserve the power to "order the production of any evidence…" it considers necessary to establish the truth.[51]

In light of this, the Rome Statute and relevant case law specify several general rules that create a reliability and credibility framework within the broader admissibility requirements of the Rome Statute. Therefore, by analysing how this framework applies to satellite imagery, this Paper will answer the following research question:

[49] Triffterer and Ambos (n 45) 1716.
[50] Rome Statute (n 44) article 64(d).
[51] Rome Statute (n 44) article 69(3).

What conclusions regarding the reliability and credibility standards dealing with other types of evidence can be transferred from general ICC case law to the use of satellite imagery as evidence of criminal responsibility in the proceedings before the Court?

The thesis will start answering the research question by first establishing the general context in which the Court evaluates the admissibility of evidence under articles 69(4) and 69(7) of the Rome Statute. This Chapter will demonstrate that a comprehensive evaluation takes place in a step-by-step process, requiring first a positive assessment of the evidence's relevance to the proceedings, its probative value, and prejudicial effect. Afterward, the evidence must also satisfy a second (negative) evaluation that an entity did not obtain the information by means that violated internationally recognized human rights and cast substantial doubt on the reliability of the evidence or the integrity of the proceedings.

After discussing the general context, in Chapter Chapter 2: The General Context of Admissibility of Evidence under Article 69 (4) and (7) of the Rome Statute, there will be a detailed evaluation of the admissibility of satellite imagery under article 69(7) of the Statute in Chapter Chapter 3: Detailed Evaluation of the Admissibility of Evidence under Article 69 (7) ICC Statute. This Chapter will address the concerns about the right to privacy and its impact on the admissibility and reliability of satellite imagery as evidence of criminal responsibility under the Rome Statute.

In Chapter Chapter 4: Other Rules on Reliability and Credibility of Evidence, the Paper will explore general case law dealing with the credibility and reliability standards of other types of evidence. Here, the research will make conclusions about how the criteria for different types of evidence apply to the use of satellite imagery as evidence in proceedings before the Court. In *Section* 4.1 Rules Governing the *Credibility* of Other Types of Evidence*,* a specific focus will be on the source's credibility, and *Section 4.2* Rules Governing the *Reliability* of Other Types of Evidence will concentrate on the reliability of the information.

The Paper concludes with an overall assessment of the admissibility of satellite imagery and the factors that the OTP is obliged to consider when determining if the image complies with

the Rome Statute's procedural rules on the admittance of evidence and the criteria specified in general ICC case law.

1.3 Methodology

The research will be delimited to the rules governing the international criminal procedures at the ICC and will primarily be based on the Rome Statute, the ICC's Rules of Procedure and Evidence, and ICC case law. Also, as the Court's judgements make frequent reference to the case law of other international courts and tribunals and considering the lack of ICC jurisprudence on the use of satellite imagery, this Paper will treat the judgements of the ICTR, ICTY, and ECtHR as supporting material.

This thesis takes into consideration that not all the information gathered by satellite imagery will qualify as evidence or serve the same purpose. It is, for example, possible that an image does not satisfy the admissibility requirements but that the Court still uses the image to support a more conventional type of evidence, as was the case in *Katanga and Ngudjolo*, where the Court only used satellite imagery to identify the location of alleged crimes.[52] The current thesis focuses specifically on satellite imagery as evidence of the offence upon which the charges are based (crime-based evidence) or as evidence of the responsibility of the alleged perpetrator for the crimes committed (linkage evidence).[53] Therefore, excluding the use of satellite imagery as a means to corroborate other evidence such as forensic evidence, witness testimony, and the reliability of intercept communications.

[52] The Prosecutor v. Germain Katanga (Decision on the Review Concerning Reduction of Sentence) ICC-01/04/01/07 (13 November 2015) 20.
[53] OHCHR (n 28) 27.

Because of the higher evidentiary standard, the Paper concentrates on the reliability and credibility standards applicable to satellite imagery at the trial Stage over the pre-trial stage. To convict the accused at the trial stage, article 66 of the Rome Statute states that the Court must be convinced of the accused's guilt "beyond a reasonable doubt."[54] On the other hand, there only has to be a "reasonable basis" for the Court to proceed with an investigation at the pre-trial stage.[55] Despite the OTP applying the lower threshold of the pre-trial stage at the investigative stage of the proceedings, this Paper decided on a higher evidential standard to account for the fact that the research has to bridge a lack of jurisprudence by drawing analogies from ICC case law dealing with other types of evidence.[56] As a result, the reliability and credibility framework in this Paper addresses the strictest classification of evidence that remains applicable even when the ICC constructs an official framework to confront the submission of satellite imagery in proceedings before the Court.

Finally, to come to a clear conclusion about the admissibility of satellite imagery in proceedings before the ICC, the Paper distinguishes between the credibility of the source and the reliability of the information. Reliability is defined as the quality of the information, and credibility as the source's legitimacy.[57] The two criteria are defined separately because of the possibility for a non-credible source to submit an image containing reliable information, just as the other way around is also possible.[58] For example, a respected firm with notoriety in the industry can be considered a credible source. Yet, they may still submit a non-reliable image because of a mistake in the methodology when analysing the data. The research, therefore, addresses the two criteria separately.

[54] Rome Statute (n 44) article 66.
[55] Rome Statute (n 44) article 58.
[56] Rome Statute (n 44) article 53(1).
[57] OHCHR (n 28) 18.
[58] Ibid.

Chapter 2: The General Context of Admissibility of Evidence under Article 69 (4) and (7) of the Rome Statute

As a general rule, the Trial Chamber of the International Criminal Court will first determine the admissibility of evidence in accordance with the procedure in article 69(4).[59] It is only after the Court has determined that the evidence complies with this first test that it evaluates the evidence against the rules on the mandatory exclusion of evidence in article 69(7).[60] The credibility and reliability criteria are assessed throughout the overall admissibility test, but most comprehensively when evaluating the probative value in article 69(4).[61] Accordingly, this section will set out how the Trial Chamber interprets the admissibility test in article 69(4) article 69(7).

2.1 General Context of Credibility and Reliability Under Article 69 (4)

In article 69(4) of the Statute, it sets out the following procedure:

> "The Court may rule on the relevance or admissibility of any evidence, taking into account, *inter alia*, the probative value of the evidence and any prejudice that such evidence may cause to a fair trial or to a fair evaluation of the testimony of a witness, in accordance with the Rules of Procedure and Evidence."

[59] Triffterer and Ambos (n 45) 1716.
[60] Ibid.
[61] The Prosecutor v. Thomas Lubanga Dyilo (Decision on the Admissibility of Four Documents) ICC 01/04-01/06 (13 June 2008) 5.

The fifth session of the Preparatory Commission decided not to include an assessment of the *prima facie* reliability and credibility of evidence in the rules of the Statute.[62] A commonly shared view of the commission was that the "fundamental or substantive principles of evidence should figure in the Statute itself."[63] While at the same time, secondary and subsidiary rules could appear in the jurisprudence of the Court or other instruments.[64] Hence, the Court was granted the flexibility to detail additional 'rules' on the admissibility of evidence in its practice.[65]

Because of the committee's decision, the Court's analysis of article 69(4) in *Lubanga* is an authoritative source on the admissibility criteria.[66] In the ruling, the Chamber affirmed the reasoning of the ICTY in *Prosecutor v. Stakic,* supporting the view that an assessment of the *prima facie* credibility and reliability of evidence is a part of an inquiry into probative value.[67]

In *Lubanga,* the Prosecution stated that the test in article 69(4) is straightforward and can be reduced to "requiring the evidence to be relevant to the case, having probative value, and being *prima facie* reliable."[68] Indeed, the Chamber's responded to the Prosecutor's statement by further clarifying that the approach should be the following:

> **Step 1:** "The Chamber must ensure that the evidence is *prima facie* relevant to the trial, in that it relates to the matters that are properly to be considered by the Chamber in its investigation of the charges against the accused (…)."[69]
>
> **Step 2:** "The Chamber must assess whether the evidence has, on a *prima facie* basis, probative value. In this regard, there are innumerable factors that may be relevant to this evaluation (…). The Appeals Chamber in *Aleksovski* stated that the indicia of reliability include whether the evidence is "voluntary, truthful, and trustworthy (…)."[70]
>
> **Step 3:** "The Chamber must, where relevant, weigh the probative value of the evidence against its prejudicial effect. Whilst it is trite to observe that all evidence that tends to incriminate the accused is also "prejudicial" to him, the Chamber must be careful to ensure that it is not unfair to admit the disputed material, for instance, because evidence of slight or minimal probative value has the capacity to prejudice the Chamber's fair assessment of the issues in the case."[71]

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[62] Triffterer and Ambos (n 45) 1718.
[63] Ibid.
[64] Ibid.
[65] Ibid.
[66] *Lubanga* Four Documents (n 61) 16.
[67] Prosecutor v. Stakic´, (Provisional Order on the Standards Governing the Admission of Evidence) IT-97-24 (25 February 2002) 20.
[68] *Lubanga* Four Documents (n 61) 5.
[69] Ibid., 16.
[70] Ibid.
[71] Ibid.

It can be concluded from the admissibility test set out in *Lubanga* that 'credibility' and 'reliability' are encompassed in the broader criteria of probative value, which, together with relevance and prejudicial effect, make up the overall evaluation of the evidence. Hence, it can be reasoned that credibility and reliability are not assessed separately but in conjunction with other evidential qualities.[72]

Considering that the Preparatory Commission granted the Court the authority to further interpret the application of the admissibility 'rules', it follows that for any alleged evidence to be admissible in the trial stage, the test set by the Court must be followed.[73] Indeed, this means that the OTP must apply the same test in its initial evaluation of satellite imagery. Thus, the OTP must first ensure that the evidence is *prima facie* relevant to the trial. The Prosecutor must then assess whether the evidence has probative value. Finally, it must weigh the probative value against its prejudicial effect.

2.1.1 Relevance

From the excerpts outlined above, when the Trial Chamber considers the admissibility of a piece of evidence, the judges must first ensure that the evidence is *prima facie* relevant to the issues of the case.[74] Should the Chambers rule that the evidence is irrelevant to the events under consideration, the judges shall make no further assessments of the evidence's probative value or whether the probative value outweighs any potential prejudicial effect.[75]

For example, the Trial Chamber in *Ntaganda* was tasked with determining the relevance of satellite imagery purportedly showing the aftermath of the incident in question.[76] Once the Chambers agreed that they could not determine the image's relevance to the proceedings, they declined to admit it into evidence without moving on to consider its probative value or prejudicial effect.[77]

[72] Laving, *The Reliability of Open-Source Evidence in ICC* (2014) 26.
[73] Triffterer and Ambos (n 45) 1716.
[74] *Lubanga* Four Documents (n 61) 5.
[75] Triffterer and Ambos (n 45) 457.
[76] Prosecutor v. Ntaganda (Judgement) ICC-01/04-02/06-2359 (8 July 2019) (28 March 2017) 31.
[77] Ibid., 32.

The term relevance has been extensively interpreted by the ICTY, according to which evidence is relevant to an incident if it throws light on the matter by reason of proximity in time, place, or circumstance.[78] In ICC case-law, a comparable interpretation of relevance is discernible. In *Katanga and Ngudjolo,* the Trial Chamber clarified that for evidence to be qualified as relevant, it must make "the existence of a fact at issue more or less probable."[79] Under this broad classification, relevance is a relational concept or nexus, the purpose of which is to connect the evidence in question with the asserted facts sought to be proven or disproven.[80] Therefore, as the Court stated in *Lubanga*, the crucial element of relevance is its relation to the matters to be considered by the Chamber.[81] Here, it must be pointed out that the term 'matter' in relation to the proceedings is not equivalent to the 'incident' or 'event' under consideration by the Court.[82]

To explain the difference between the terms, by way of example, in *Prosecutor v Gombo*, the Trial Chamber ruled that a UN Report "may be of relevance to the Chamber's determination of the accused's *mens rea* in accordance with article 28(a) of the Statute."[83] This case highlights that evidence might also be relevant if it throws light on immaterial aspects of the case not directly concerning the 'event' itself. Therefore, a Chamber will consider evidence relevant if it indicates, for example, the capacity of the accused, an individual's broader role in the incident, or any other element relevant to the material and immaterial 'matters' of the case.[84]

In the context of Earth Observation, it must be acknowledged that it is more problematic to demonstrate the relevance of satellite imagery than the relevance of more conventional investigation methods.[85] In part, this is because a judge without special training cannot easily connect the information in the image to the actual event.[86] Instead, the presentation of satellite-based evidence to the Court will generally require the testimony of a person with specific expertise or the submission of a technical report detailing 'all' the relevant information

[78] Prosecutor v. Delalic (Decision on the Motion of the Prosecution for the Admissibility of Evidence) (19 January 1998) para 31.
[79] Prosecutor v. Katanga and Ngudjolo (Decision on the Bar Table Motion) ICC-01/04-01/07-3184 (21 October 2011) 16.
[80] Ambos, *Treatise on International Criminal Law* (2016) 457.
[81] *Lubanga* Four Documents (n 61) 16.
[82] Gosnell, *Admissibility of Evidence* (2010) 385.
[83] Prosecutor v. Jean-Pierre Bemba Gombo (Decision on the Admission into Evidence of Items) ICC-01/05-01/08-2299 (27 June 2013) para 12.
[84] Ibid.
[85] Ginzky (n 6) 114.
[86] Kay (n 10) 17.

captured by the image.[87] This may include information that is only partly relevant to the matters before the Court, such as the area's population, topography, environmental impact, etc.[88] Thus, the nexus between satellite evidence and the matters considered by the Chamber will vary for each specific section of the report.

Additionally, Earth Observation has an inherent temporal limitation.[89] For most cases falling within the mandate of the ICC, the OTP does not investigate the situation until after an extensive period has passed since the events occurred.[90] Although remote-sensing firms constantly capture low-resolution images worldwide, firms typically do not begin capturing and storing mid-resolution (Figure Figure 1. New Mass Burial Sites Following Srebrenica Massacre.) and high-resolution images of specific locations until commissioned with this task.[91] Hence, the longer the delay, the more likely it is that evidence becomes available to the Court indicating that changes could have arisen between the event's occurrence and the time the satellite took the images.[92] This, in turn, would place the Trial Chamber in a position where it can no longer establish beyond a reasonable doubt that what the images show is a consequence of the event under consideration.[93] In *Ntaganda*, the Trial Chamber was confronted with precisely such a situation where OTP took the satellite images more than a month after an attack.[94] Consequently, the Trial Chamber ruled that the evidence is irrelevant and "of limited use to establish whether, and if so how, any destruction took place during the events that are subject to the charges."[95]

The outcome of the relevance evaluation is considerably different for both the UN report in *Gombo* and the satellite images in *Ntaganda.* Although the UN report did not discuss the 'events' under consideration during the trial, the Chambers still qualified it as relevant for other aspects of the case.[96] Conversely, whilst the satellite images did depict the events in question, the photos fell outside the temporal scope of the charges and did not relate to the 'matters' at

[87] Ibid.
[88] Ibid.
[89] Chaturvedi, *Satellite Imagery in International Human Rights Litigation* (2015) 2.
[90] *Ntaganda* Judgement (n 76) 454.
[91] Ibid.
[92] Ibid.
[93] Ibid.
[94] Ibid.
[95] Ibid., 569
[96] *Bemba* Admissibility Decision (n 83) 12.

the core of the proceedings.[97] From the Courts' evaluation, it can be concluded that the distinction between relevant and irrelevant geospatial information could be marginal and vary per section of the image-analysis report. Crucially, however, for satellite imagery to be classified as relevant, it must be contemporaneous to the events it purports to be showing and relate to the matters that are properly to be considered by the Trial Chamber.[98]

After passing the relevance test, the Trial Chamber does not automatically move geospatial information into evidence. At the 5th Preparatory Committee, the State Parties ensured that "relevancy is not the sole determinant of admissibility and that other factors need to be considered."[99] So, the Committee based article 69(4) of the Rome Statute on ICTY Rule 89 lit.(d), which provides that a Chamber may exclude evidence if, *inter alia,* the probative value is outweighed by its prejudicial effect.[100]

2.1.2 Probative Value and Prejudicial Effect

After classifying evidence as relevant, the next part of the admissibility test is to determine probative value.[101] Often used interchangeably with the concept of weight, the 'probative value' concerns the extent to which evidence can prove the facts it purports. In contrast, 'weight' determines how important a piece of evidence will be to the ruling on an asserted fact.[102] At the preliminary stage, the OTP assesses probative value, while the Trial Chamber assigns weight to the evidence in the final analysis.[103] Notably, for the OTP to consider evidence probative, the evidence must meet an initial threshold.[104] As the probative value is not a quantum and cannot be measured in standardized units, the jurisprudence of the ICC, ICTY, and ICTR demonstrate that the main factors in assessing probative value are the same indicia of credibility and reliability the judges use to accord evidentiary weight.[105]

[97] *Ntaganda* Judgement (n 76) 569.
[98] Ibid.
[99] Triffterer and Ambos (n 45) 1718.
[100] Ibid.
[101] *Lubanga* Four Documents (n 61) 5.
[102] Gosnell, *Admissibility of Evidence* (2010) 385.
[103] Ibid.
[104] Ibid.
[105] Ibid.

In the practice of the ICTY, the reliability assessment is closely related to that of credibility.[106] In the case of *Kunarac*, the Trial Chamber compared the two elements by stating that credibility "depends upon whether the witness should be believed."[107] Whereas reliability "assumes that the witness is speaking the truth, but depends upon whether the evidence, if accepted, proves the fact to which it is directed."[108] Generally, the distinction between the two elements is blurry, and discourse on the precise parameters that credibility and reliability encompass is unsettled.[109]

As clarified by the ICC Trial Chamber in *Lubanga*, "innumerable factors" collectively act as the determinants of credibility and reliability.[110] The ICTR reached a comparable conclusion in the *Musema Trial Judgment,* wherein the Chamber enumerated that the two elements depend upon many circumstances, including the evidence's corroboration, origin, and content.[111] Across the Court's and Tribunal's case-law, it is commonly agreed that no specific or rigid standards exist due to the desire to leave it to the Trial Chamber to make a case-by-case assessment depending on the type of evidence the Parties present before it.[112] Nevertheless, following the Court's reasoning in *Lubanga*, it is evident that the OTP, while conducting its initial investigation, may only consider satellite imagery to have probative value if it is credible and reliable.[113]

After determining the probative value, pursuant to article 69(4), the OTP must account for any prejudice the evidence may cause to a fair trial or a fair evaluation of the testimony of a witness.[114] The 5th Preparatory Committee included this provision to safeguard the accused's right to a fair and impartial trial.[115] Therefore, in assessing the evidence, the OTP should ensure that it does not submit material of minimal probative value that may have the capacity to prejudice the Chamber's fair assessment of the issues in the case.[116] Significantly, when the

[106] Prosecutor v. Édouard Karemera *et al* (Decision on Appeal of Decision on Admission of Evidence) ICTR98-44-AR73.17 (2 May 2009) 14.
[107] Prosecutor v. Dragoljub Kunarac et al (Decision on Motion for Acquittal) (3 July 2000) para 7.
[108] Ibid.
[109] Gosnell, *Admissibility of Evidence* in Khan, Buisman, and Gosnell (eds), *Principles of Evidence in International Criminal Justice* (OUP 2010) 385.
[110] *Lubanga* Four Documents (n 61) 5.
[111] Prosecutor v. Alfred Musema (Judgment and Sentence) ICTR-96-13-A (27 January 2000) 42.
[112] Triffterer and Ambos (n 45) 1718.
[113] *Lubanga* Four Documents (n 61) 16.
[114] Rome Statute (n 44) article 69(4).
[115] Triffterer and Ambos (n 45) 1718.
[116] Gosnell (n 108) 385.

OTP does submit prejudicial evidence, this provision does not obligate the Trial Chambers to declare the evidence inadmissible.[117] Instead, practice demonstrates that the judges will factor this quality into the overall weight of the evidence.[118]

For example, during an investigation, the OTP might purchase a high-resolution satellite image that purportedly shows the accused on the crime scene on the day of the incident. Assuming the OTP purchased the high-resolution image from a commercial remote-sensing firm, the resolution ability will vary between 5m and 40cm.[119] Suppose the satellite was operating at maximum capacity, the image would still not be capable of showing the face or identity of the accused.[120] Because of the satellite's technical limits, the image cannot be relied on to prove the asserted facts. However, suppose there is already suspicion that the accused was in the vicinity of the crime. In that case, the image could have a strong prejudicial effect on the Trial Chamber's fair assessment of the issues of the case.[121] In this way, the image, which cannot be considered entirely reliable for identifying individuals, could nevertheless have a prejudicial effect on the proceedings.

In the above example, the poor quality of the image would not make the evidence inadmissible.[122] Instead, the Trial Chamber would factor this quality into the probative value and attribute a lower overall weight to the evidence.[123] As mentioned earlier, many other factors also affect the credibility and reliability of the evidence.[124] Concerning Earth Observation, the Court sets out several relevant rules for assessing probative value for other types of digital evidence in its case-law. Therefore, in Chapter Chapter 4: Other Rules on Reliability and Credibility of Evidence, this Paper will discuss the interplay between different credibility and reliability rules applicable to Earth Observation. That said, before diving into this discussion, the evidence must first satisfy a second (negative) evaluation that an entity did not obtain the information by means that violated human rights law and cast substantial doubt

[117] Ibid.
[118] Schomburg and Nemitz, *International Criminal Courts and Tribunals* (2019) 25.
[119] Lang (n 15) 68.
[120] Ibid.
[121] Gosnell (n 108) 395.
[122] Ibid., 385.
[123] Ibid.
[124] *Lubanga* Four Documents (n 61) 5.

on the reliability of the evidence or the integrity of the proceedings as set out in article 69(7) of the Rome Statute.[125]

2.2 General Context of Credibility and Reliability Under Article 69 (7)

Generally, the Trial Chamber and the OTP have considerable discretion to determine the admissibility of evidence in accordance with the procedure in article 69(4) of the Rome Statute.[126] However, this discretion is subject to a separate (mandatory) standard on the exclusion of evidence in article 69(7) of the Rome Statute, which declares evidence unreliable and inadmissible depending on the method by which it was obtained.[127]

In *Section 2.1.2 Probative Value and Prejudicial Effect*, the credibility and reliability framework are both encompassed in the broader criteria of probative value. Conversely, the admissibility test under article 69(7) explicitly targets evidence that cannot be considered 'reliable' because it was obtained by means that violate the [*Statute*] or internationally recognized human rights. According to paragraph (b), any material obtained in this manner shall not be admissible if "the violation casts substantial doubt on the reliability of the evidence."[128]

In drafting article 69(7), delegations at the final sessions of the Ad hoc Committee on the *Establishment of an International Criminal Court* posited four philosophical bases for excluding evidence.[129] Accordingly, evidence would be inadmissible if:

[125] Ibid.
[126] Gosnell (n 108) 385.
[127] Ibid.
[128] Rome Statute (n 44) article 69(7)(b).
[129] Triffterer and Ambos (n 45) 1720.

1) The means of collection of the evidence constituted a serious violation of the Rome Statute;[130]
2) The means of collection constituted a serious violation of internationally recognized human rights;[131]
3) The manner of collection would cast substantial doubt on the reliability of the evidence;[132]
4) There could be a detrimental effect on the integrity of the proceedings by admitting the evidence.[133]

The State Parties at the Rome Conference unanimously adopted adaptations of the above formulations in the final draft of article 69(7).[134] It is notable that throughout the negotiation process, each of the delegations acquiesced that the rules of the Court must prevent and disincentivize relevant actors from procuring evidence through means that could have a detrimental effect on the reliability of the evidence or the legacy of the Court.[135]

Accordingly, the delegations introduced article 69(7) to protect the integrity of the proceedings from confessions obtained through torture or other illegitimate methods.[136] Because of this provision, the Trial Chamber may only rule evidence admissible in the proceedings after ascertaining that the evidence is reliable and not proffered due to duress caused by the circumstances of a Rome Statute or human rights violation.[137] Correspondingly, the OTP must take similar precautions in its initial evaluation of the evidence at the preliminary stage of the proceedings.

Concerning the application of article 69(7) to satellite-based evidence, it is probable that under specific circumstances, the relevant Parties might violate some rights throughout the data collection, analysis, and storage process that may affect the reliability of the evidence or the integrity of the proceedings. Therefore, the next section will provide a detailed evaluation of

[130] UN Preparatory Committee, *Decision* (18 December 1997) 38.
[131] Ibid., 39.
[132] Ibid., 40.
[133] Ibid., 41.
[134] UN Preparatory Committee (n 129) 38.
[135] Ibid.
[136] Triffterer and Ambos (n 45) 1720.
[137] Ibid.

different situations relevant to the admissibility of satellite imagery under article 69(7) of the Rome Statute.

Chapter 3: Detailed Evaluation of the Admissibility of Evidence under Article 69 (7) ICC Statute

After the ICC Trial Chamber has determined the admissibility of evidence following the procedure in article 69(4) of the Rome Statute, the Court will evaluate the evidence against the rules on the mandatory exclusion of evidence in article 69(7) of the Rome Statute.[138] The conditions for the exclusion of evidence in article 69(7) stipulate that evidence obtained by means of a violation of the [*Rome Statute*] or internationally recognized human rights shall not be admissible if:

(a) The violation casts substantial doubt on the reliability of the evidence;
(b) The admission of the evidence would be antithetical to and would seriously damage the integrity of the proceedings.

As clarified by the Trial Chamber in *Lubanga*, evidence obtained in violation of article 69(7) of the Rome Statute does not automatically exclude it from the proceedings.[139] Instead, the Chambers have the discretion "to seek an appropriate balance between the Rome Statute's

[138] Rome Statute (n 44) article 69(7).
[139] Prosecutor v. Thomas Lubanga Dyilo (Decision on Confirmation of Charges) ICC-01/04-01/06 (29 January 2007) 84.

fundamental values in each concrete case."[140] The ICC case-law on article 69(7) suggests that the judges must make four relevant and separate analyses of the evidence to determine the 'appropriate balance.'[141] Each analysis corresponds to one of the four philosophical bases for excluding evidence, listed in *Section 2.2 General Context of Credibility and Reliability Under Article 69 (7)* that the State Parties adopted into the final draft of article 69(7) at the Rome Conference.[142]

Following this four-step process, in the first and second phases of the analysis, the Chambers must determine whether the evidence collection violates the Rome Statute or internationally recognized human rights.[143] Should the judge rule that the relevant Parties did obtain the evidence in violation of either treaty body, the Trial Chamber must then decide whether the violation satisfies the conditions in article 69(7) subsections (a) or (b).[144] Hence, following a positive assessment in phase one or two, the Chambers must conduct a third and fourth analysis examining how the nature of the violation impacts the reliability of the evidence per article 69(7)(a) or whether the evidence is "antithetical to" and "would seriously damage" the integrity of the proceedings per article 69(7)(b).[145]

As such, for a Trial Chamber to rule that unlawfully obtained evidence is inadmissible in proceedings before the ICC will depend on the nature of the infringement and how the violation weighs against the fundamental values contained within the Statute and human rights law.[146] Considering that the OTP must make an initial evaluation of the evidence's admissibility under article 69(7) at the preliminary stage of the proceedings, it follows that for satellite-based evidence to be admissible before the Court, the OTP must, at least, *prima facie,* apply this four-step approach. Hence, this Chapter will assess satellite-based evidence against each of the four steps.

3.1 Phase 1: Evidence Obtained by Means of a *Rome Statute* Violation

[140] Ibid.
[141] Soliman, *Admissibility of Illegally Obtained Cyber Evidence* (31 May 2020) 10.
[142] Triffterer and Ambos (n 45) 1720.
[143] Soliman (n 140) 10.
[144] Ibid.
[145] Soliman (n 140) 10.
[146] *Lubanga* Confirmation of Charges (n 138) 84.

In the first phase of the analysis, the Trial Chamber assesses whether the Parties obtained the evidence in violation of the Rome Statute and, subsequently, if this violation satisfies the conditions in article 69(7) subsections (a) or (b). There is considerable disagreement in the literature on whether the Preparatory Committee intended to include the Rules of Procedure and Evidence (RPE*)* within the scope of "violations of the Rome Statute."[147] However, this discussion is not relevant to satellite-based evidence as the RPE do not include protections applicable to the admissibility of digital evidence.[148] Instead, the pertinent provisions of the Rome Statute focus exclusively on the rights of witnesses, victims, and the accused.[149]

Notably, neither the ICC nor the Tribunals have held that any of these rights are implicated in the type of unlawful acquisition of evidence that may occur around Earth Observation or any other digital evidence.[150] Therefore, this first analysis is not relevant to satellite-based evidence. As the rights in the Rome Statute are primarily applicable to classical investigation methods, e.g., victim interviews, then the second analysis of what qualifies as an "internationally recognized human right" might apply to Earth Observation.

3.2 Phase 2: Evidence Obtained by Means of a Violation of *Internationally Recognized Human Rights*

In the second phase of the analysis, the Trial Chamber must assess whether the evidence collection violates internationally recognized human rights. In the ICC case law, the human right that the Defence most commonly asserts against the admissibility of digital evidence, particularly aerial photographs from drones, is the right to privacy.[151] Given that the nature of satellite imagery consists of data and that the function of Earth Observation is comparable to aerial photography, namely, to remotely identify (ground) activity and property, it can be presumed that the right to privacy will also be a relevant human right with regard to the admissibility of satellite-based evidence under article 69(7) of the Rome Statute in proceedings before the ICC.[152]

[147] Piragoff and Clarke, *Article 69 Evidence* (14 January 2016) 63; Gosnell, *The Changing Context of Evidential Rules* (15 January 2010) 221.
[148] Soliman (n 140) 10.
[149] Rome Statute (n 44) article 55,66.
[150] Soliman (n 140) 10.
[151] Soliman (n 140) 12.
[152] Ibid.

Privacy is defined in article 17 of the International Covenant on Civil and Political Rights (ICCPR) as:

> "No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home, or correspondence, nor to unlawful attacks on his honour and reputation".[153]

The Pre-Trial Chamber in *Lubanga* specified that a violation of privacy rights under the ICCPR is contingent on the *lawfulness* and *proportionality* of the means used by the Parties to collect evidence.[154] In the *Confirmation of Charges*, the Pre-Trial Chamber elaborated that even though the Congolese police authorities conducted their search and seizure operation in compliance with domestic criminal proceedings, the operation violated the principle of proportionality due to the magnitude of items the authorities confiscated that were not directly relevant to the case.[155] As a consequence of the disproportionate means used by the Congolese authorities to collect evidence, the Chambers held that the authorities violated the defendant's internationally recognized right to privacy.[156]

Turning to the relationship between privacy rights and Earth Observation, different types of satellite resolution give rise to different concerns.[157] Noticeably, most people correlate the growth of high-resolution data with their uncertainty about the technology.[158] However, as of 2022, even high-resolutions imagery is not capable of showing the face or identity of an individual.[159] Instead, Earth Observation may violate privacy rights when a satellite-based investigation aggregates enough Personally Identifiable Information (PII) to transform a blurry individual in an image from an arbitrary to a distinguishable figure.[160]

In *Digital Rights Ireland*, the Court of Justice of the European Union defined PII as "data that allows the Parties to draw very precise conclusions concerning the private lives of the persons

[153] ICCPR (23 March 1976) article 17.
[154] *Lubanga* Confirmation of Charges (n 138) 84.
[155] Ibid.
[156] *Lubanga* Confirmation of Charges (n 138) 90.
[157] Lang (n 15) 68.
[158] Ibid.
[159] Ibid.
[160] Ibid.

whose data has been retained, such as the habits of everyday life, permanent or temporary places of residence, daily movements, and the social environments frequented by them."[161]

Applying the approach of the Pre-Trial Chamber in *Lubanga* to satellite-based evidence, one can conclude that the use of Earth Observation to document intelligence on a suspect might violate privacy rights if the remote-sensing firm contracted by the OTP conducts the investigation in contravention of domestic law or if the remote-sensing firm records (excessive) amounts of PII that is otherwise irrelevant to the case.[162]

This violation can be illustrated by way of a hypothetical example. The OTP may rely on high-resolution imagery to detect threats to the civilian population. Although the satellite cannot identify individuals, the image-analysis reports can profile the accused and innocent third parties after weeks of recording data on car patterns, structural changes to houses, and other large-scale movements.[163] Should the OTP not have informed the data subjects of the investigation, this will infringe on the right to information self-determination and autonomous and informed decision-making.[164] According to the TC in *Lubanga*, "the fact that a violation involves the human rights of a third person, other than the defendant, is not relevant when deciding whether the first step under article 69(7) is satisfied."[165] Consequently, the Court would interfere with an individual's "privacy, family, and home" and violate that individual's right to privacy as codified in article 17 of the ICCPR.[166]

Irrespective of whether Earth Observation constitutes a breach of privacy rights, it is questionable whether such a breach is a legitimate ground for excluding evidence based on article 69 (7) of the Rome Statute. In the final decision on the admissibility of the evidence in *Lubanga*, the Trial Chamber deemed the materials confiscated by the Congolese authorities admissible as evidence in the proceedings despite the Chamber's earlier decision that the search and seizure operation violated the defendant's right to privacy.[167] What is substantial about the *Lubanga* case is that in the evaluation of the appropriate balance between the Rome

[161] Digital Rights Ireland Ltd v. Minister for Communications (8 April 2014) para 27.
[162] Purdy and Leung (n 5) 32.
[163] Lang (n 15) 68.
[164] Lang (n 15) 68.
[165] *Lubanga* Confirmation of Charges (n 138) 84.
[166] ICCPR (n 152) article 17.
[167] Prosecutor v. Thomas Lubanga Dyilo (Decision on the Admission of Material from the Bar Table) ICC-01/04-01/06 (24 June 2009) 27.

Statute's fundamental values and the violation of the right to privacy, the Trial Chamber decided that (unlawfully) obtained evidence might be admissible if the offense is only a minor breach of the criteria in subsections (a) and (b) of article 69(7) of the Rome Statute.[168]

In order for the OTP to accurately assess the evidence's admissibility during the investigative stage of the proceedings, the Prosecutor must, therefore, examine, in phase 3 of the analysis, how a violation of privacy rights impacts the reliability of satellite imagery as evidence of criminal responsibility under the Rome Statute.

3.3 Phase 3: Article 69 (7) (a) of the ICC Statute – 'The violation casts substantial doubt on the reliability of the evidence'

This section presumes that the use of Earth Observation to document evidence of international criminal responsibility disproportionately infringes on an accused's right to privacy, as illustrated in *Section 3.2 Phase 2: Evidence Obtained by Means of a Violation of Internationally Recognized Human Rights*. Proceeding with this assumption, for the Trial Chamber to rule evidence inadmissible in the proceedings before the Court, according to article 69(7) subsection (a) of the Rome Statute, the violation must cast "substantial doubt on the reliability of the evidence."

The authoritative source on the application of article 69(7)(a) of the Rome Statute in proceedings before the ICC is the *Lubanga Bar Table Motion.*[169] In particular, the Chamber's analysis of how the Congolese search and seizure operation affected the reliability of the evidence is relevant.[170] Here, the Chambers pointed out the following:

[168] Ibid.
[169] Soliman (n 140) 10.
[170] Ibid.

> "The infringement of the principle of proportionality did not affect the reliability of the evidence seized from the suspect's home on the ground that had the search and seizure been conducted in full adherence to the principle of proportionality, the content of the evidence would not have been different."[171]

This section of the judgement narrows down the number of 'internationally recognized human rights' violations that can adversely affect the reliability of the evidence.[172] Following the Chamber's circumscribed application of this provision, a human rights violation will only cast 'substantial doubt' on the reliability of the evidence if the offense is a decisive factor in its final content.[173] In other words, if the content of the evidence would not change had the investigation been conducted in full adherence to the right in question, then the violation would not satisfy the condition in article 69(7)(a) of the Rome Statute.[174]

Accordant with this interpretation of article 69(7)(a), the Trial Chamber in *Lubanga* ruled the evidence seized by the Congolese authorities admissible in the proceedings on the basis that the content of the evidence would not have been different had the authorities conducted a more proportionate search and seizure operation.[175] The ICC Trial Chamber reached a comparable conclusion in the *Mbarushimana* case where it held that the unlawful interception of cell phone conversations did not "impact the reliability of the evidence thereby obtained."[176]

On the other hand, a situation where a human rights violation could substantially change the content of the evidence is during a more traditional investigation.[177] For instance, during an interrogation, should the suspect be subject to waterboarding, starvation, or other types of inhumane treatment, it is plausible that the content of their statement would have been different had the interrogators maintained full respect for the suspect's human rights.[178]

Considerable disagreement exists on whether Earth Observation can violate the suspect's right to privacy or any other internationally recognized human right.[179] However, even if Earth

[171] *Lubanga* Bar Table (n 159) 85.
[172] Soliman (n 140) 15.
[173] Ibid.
[174] Ibid.
[175] *Lubanga* Bar Table (n 159) 85.
[176] Prosecutor v. Callixte Mbarushimana (Decision on the Confirmation of Charges) ICC-01/04-01/10 (16 December 2011) 71.
[177] Laving, *The Reliability of Open-Source Evidence* (2014) 40.
[178] Ibid.
[179] Purdy and Leung (n 5) 20.

Observation does indeed violate privacy rights, it is improbable that the Chamber would exclude the evidence from the proceedings based on the condition in article 69(7)(a) of the Rome Statute.[180]

This Paper can reach such a conclusion in view of the fact that informing the data subject of the investigation and protecting their private information are measures the remote-sensing firm must take separate from the data collection and rendering process.[181] Since the content of satellite-based evidence does not change whether an investigation does or does not fully adhere to a person's human rights, it is unlikely that the Trial Chamber will rule the image(s) inadmissible in the proceedings before the Court.[182]

As it is improbable that any human rights violation falling within the scope of article 69(7)(a) of the Rome Statute could cast substantial doubt on the reliability of satellite-based evidence, it can be concluded that the exclusionary rule in article 69(7)(a) is foremost applicable to more classical investigation methods such as interviews and interrogations.[183] Hence, for the evidence to be admissible in the proceedings before the Court, the OTP is left with a final analysis of whether the image is "antithetical to" and could "seriously damage" the integrity of the proceedings per article 69(7)(b) of the Rome Statute.

3.4 Phase 4: Article 69 (7) (b) of the ICC Statute – 'The admission of the evidence would be antithetical to and would seriously damage the integrity of the proceedings'

In the final phase of the analysis, article 69(7)(b) of the Rome Statute sets out a conjunctive requirement that the evidence must be "antithetical to" and "would seriously damage" the integrity of the proceedings. The construction of article 69(7)(b) sets out a two-part test for excluding evidence.[184] Under this requirement, evidence remains admissible even if it is

[180] Ibid.
[181] Ibid., 30.
[182] Ibid.
[183] Soliman (n 140) 18.
[184] Gosnell (n 108) 385.

antithetical to the mandate of the Court so long as it does not also damage the integrity of the proceedings, and *vice versa*.[185]

The first part of this two-part test is relatively straightforward.[186] When a member or organ of the Court commissions the gathering of evidence in the knowledge that the means used are contrary to internationally recognized human rights or the Rome Statute, the evidence is automatically antithetical to the mandate of the Court.[187] In contrast, the more ambiguous condition of article 69(7)(b) concerns "damage to the integrity of the proceedings."[188]

In the limited ICC jurisprudence on the issue of 'integrity,' the Court has consistently followed the approach of the Tribunals.[189] For example, in the ICC's *Lubanga* judgment and ICTY's *Brdanin* judgment, both Trial Chamber's concluded that a disproportionate search and seizure operation does not adversely impact the integrity of the proceedings.[190] Given that the ICC has not comprehensively examined how a violation of privacy rights will impact the integrity of the proceedings, the OTP may use the case-law of the ICTY as a reference point to address this issue.

Indeed, the ICTY provides a relevant exception to the right to privacy in the case of *Karadžić*.[191] In this case, the Trial Chamber held that while the interception of telecommunications did violate the suspect's right to privacy, it did not conflict with the integrity of the proceedings.[192] Instead, the Chamber asserted that the "fundamental right to privacy is not absolute and may be derogated from in times of emergency."[193] Although it did not clarify what qualifies as an "emergency," this judgment does clearly indicate that not all privacy violations damage the integrity of the proceedings.[194]

[185] *Lubanga* Bar Table (n 159) 70.
[186] Soliman (n 140) 18.
[187] Ibid.
[188] Ibid.
[189] Soliman (n 140) 19.
[190] *Lubanga* Bar Table (n 159) 25-47.
[191] Prosecutor v. Radovan Karadžić, (Decision on the Accused's Motion to Exclude Intercepted Conversations), ICTY TC III (30 September 2010) 8.
[192] Ibid.
[193] Ibid.
[194] Ibid.

From the extensive case law of the ECtHR on the question of what qualifies as an emergency, two broad exceptions can be extrapolated where the State or a third-party may restrict privacy rights.[195] Since the ECtHR's case law is the primary human rights source cited in the ICC jurisprudence, the practice of the ECtHR provides valuable insight into this exception.[196]

Accordingly, the first exception the Court sets out in the case of *Klass v. Germany* is that satellite surveillance for national security purposes is compatible with privacy rights under the European Convention on Human Rights.[197] And second, in A v. France, the Trial Chamber recognized the prevention of crimes as another proper justification for violating privacy protection.[198]

Though neither the ICC's RPE nor the Court's approach to the admissibility of evidence are the same as those of the ECtHR, the ECtHR's practice does demonstrate that other international courts with comparable mandates to 'combat impunity' do not consider using satellite-based evidence as "damaging to the integrity of the proceedings."[199]

On account of the lack of ICC jurisprudence on the issue, this Paper cannot decisively conclude that satellite-based evidence is not antithetical to the mandate of the Court and not damaging to the integrity of the trial.[200] However, it can be deduced from the use of satellite-based evidence in the jurisprudence of the ECtHR and ICTY that it is unlikely for the ICC Trial Chamber to rule satellite-based evidence inadmissible because of the conditions set out in article 69(7)(b) of the Rome Statute.[201] Instead, numerous other factors carry more weight in the OTP's preliminary investigation on the admissibility of satellite-based evidence in proceedings before the Court.[202]

As explored in Chapter Chapter 2: The General Context of Admissibility of Evidence under Article 69 (4) and (7) of the Rome Statute and Chapter

[195] Research Division Council of Europe, *National Security and European Case-Law* (2013) 8.
[196] Soliman (n 140) 19.
[197] Klass and Others v. Germany (6 September 1978) 50.
[198] A. v. France (23 November 1993) 20.
[199] Purdy and Leung (n 5) 30.
[200] Purdy and Leung (n 5) 30.
[201] Ibid.
[202] Gosnell (n 108) 385.

Chapter 3: Detailed Evaluation of the Admissibility of Evidence under Article 69 (7) ICC Statute, the Trial Chamber can generally admit satellite-based evidence if the images are relevant and have probative value. Considering that the exclusionary rule in Chapter Chapter 3: Detailed Evaluation of the Admissibility of Evidence under Article 69 (7) ICC Statute is foremost applicable to more classical investigation methods, it is critical for the OTP to know which other factors may affect probative value.[203] Therefore, the next section will explore general case-law dealing with the reliability and credibility standards of other types of evidence and examine how the criteria for different types of evidence apply to satellite-imagery as evidence of criminal responsibility in cases before the Court.

Chapter 4: Other Rules on Reliability and Credibility of Evidence

The present Chapter will analyse the salient factors affecting the use of satellite-based evidence as evidence of criminal responsibility before the ICC. It does so based on the outcome of research into the relevant rules for assessing probative value and evidentiary weight for other types of digital evidence of a similar nature to Earth Observation in the case-law of the Court. Essential in this context are the different characters of satellite-imagery, which are reflected in

[203] Soliman (n 140) 18.

the multiple stages of data gathering from space.[204] As listed in *Section Background*, from an evidentiary weight point of view, the four critical stages in the use of satellite-imagery are: creation, transmission, storage, and interpretation.

In the examination of the admissibility of satellite-imagery, the OTP can extrapolate three key evidentiary qualities from the critical data-gathering stages listed in *Section Background,* that relate geospatial images to the reliability and credibility framework of more traditional types of evidence.[205]

First, the images are based on digital data, which, in order to be intelligible to the judges, must be interpreted by an expert.[206] It is, therefore, an interpretation of the evidence that the OTP submits to the Court, not the original data.[207] Since the Court depends on an expert to interpret the information, the evidence can be classified as 'hearsay.'[208] Correspondingly, the satellite data must meet the additional requirement for admissibility of 'hearsay.'[209]

Second, a remote sensing firm undertakes the creation, transmission, storage, and interpretation of the satellite data by electronic means.[210] This gives rise to several additional considerations relating to the credibility and reliability requirements of electronic records. By virtue of the electronic nature, the OTP must, for example, be able to verify the 'chain of custody', i.e., that the original source and end-product are connected.[211] By analogy, such requirements will apply to information documented through Earth Observation.
Third, (malicious) actors can alter geospatial data with no possibility of the Court or the OTP detecting ex post facto changes.[212] For this reason, witness testimony or other complementary forensic and anthropological reports that can corroborate the facts shown in the image are necessary to verify the accuracy of the information.[213]

[204] Purdy and Leung (n 108) 200.
[205] Kay (n 10) 17.
[206] Ibid.
[207] Ibid.
[208] Kay (n 10) 17.
[209] Ibid.
[210] Purdy and Leung (n 5) 200.
[211] Purdy, *Pulling the Threads Together and Moving Forward* (2021) 409.
[212] Williams, *Satellite Evidence in International Institutions* (2022) 202.
[213] Ibid.

Thanks to satellite-based evidence sharing these properties with other more conventional types of evidence, there is a wealth of ICC, ICTY, and ICTR case law from which to derive a general credibility and reliability framework. The OTP can, therefore, determine the probative value of satellite imagery by examining the factors that impact the credibility and reliability of electronic evidence, hearsay evidence, and evidence, like aerial photographs, that require corroboration from "ground truth," i.e., site visits, witness testimony, etc.[214]

4.1 Rules Governing the *Credibility* of Other Types of Evidence

Considering that satellite-imagery qualifies as both digital and hearsay evidence, it is important to note that credibility in the context of hearsay refers to the believability or trustworthiness of the information and source(s) thereof.[215] On the other hand, credibility in relation to digital evidence can be equated with authenticity or proof that the evidence "has not been manipulated or tampered with."[216]

Currently, there is no established procedure for verifying the credibility or authenticity of satellite-imagery in international criminal law.[217] The following sections will attempt to bridge this gap in the research by discussing various approaches that the OTP can take to affirm the credibility of satellite-imagery. These approaches include verification *via* the origin of the source, the evidence's provenance, inherent indicia of authenticity, and markers of impartiality and independence.

4.1.1 Rules on the Anonymity of Sources

It should be borne in mind that the source(s) that capture the satellite data, produce the image, and interpret the information, may well be unknown to the Court and the OTP.[218] When the source itself is anonymous, this will complicate the credibility assessment.[219]

[214] Mosteshar, *EO in the European Union* (2022) 149.
[215] OHCHR (n 28) 18.
[216] Ashouri, Bowers, Warden, *An Overview of the Use of Digital Evidence* (2014) 117.
[217] Heinsch, Irving, and Others, *Report on Digitally Derived Evidence in International Criminal Law* (2019) 31.
[218] Theresa and Others, *Geospatial Evidence in International Human Rights Litigation* (2018) 113.
[219] Ashouri, Bowers, Warden (n 208) 117.

According to Pre-Trial Chamber I in the *Gbagbo* case, the anonymous submission of evidence is highly problematic.[220] In this case, the judges held that by "depriving the Chamber of essential information about the source of the evidence, the Chamber would be in no position to assess the [credibility] of the source, making it virtually impossible to determine the probative value to be attributed to the information."[221]

Of particular concern with regard to Earth Observation is that the source's anonymity also means a lack of information about the methodology used to create the image.[222] This absence can have a detrimental effect on the probative value and, ultimately, the weight of the evidence, as it provides the defence with an easy and accessible path to cast reasonable doubt on the accuracy and credibility of the data.[223] Therefore, to avoid such an outcome, Trial Chamber II of the ICTY stressed in *Prosecutor v Tolimir* that it is imperative to prove that the source produced the satellite-image through rigorous, pragmatic, and reproducible science, i.e., an accredited methodology.[224]

Furthermore, the Pre-Trial Chamber's reasoning in *Gbagbo* demonstrates that in order to make an effective credibility assessment, the Court must be aware of who commissioned the production of the image, which commercial or state-owned satellite captured the data, and who was responsible for compiling the data into its final form.[225] That said, in cases where the OTP cannot obtain information about the source, credibility can still be ensured if the OTP presents the image to the Trial Chamber alongside reports of 'known' experts who can verify the places and activities depicted therein.[226]

In relation to anonymous testimonial evidence, the Appeals Chamber in *Mbarushimana* took a relatively stricter approach than Pre-Trial Chamber I in *Gbagbo*. According to the Appeals Chamber, a consequence of providing allegations solely through anonymous hearsay evidence is that the Defence will not be "able to investigate and challenge the trustworthiness of the

[220] Prosecutor v. Laurent Gbagbo (Decision Adjourning the Hearing on the Confirmation of Charges) ICC-02/11-01/11-432 (03 June 2013) para 27.
[221] Ibid.
[222] Herscher, *Surveillant Witnessing: Satellite Imagery* (2014) 472.
[223] Arsha and Others, *Digital Forensics: Review of Issues in Scientific Validation* (2018) 347.
[224] Prosecutor v Tolimir (Judgement) IT-05-88/2-T (12 December 2012) 69.
[225] *Gbagbo* Confirmation of Charges (n 212) para 27.
[226] *Tolimir* Judgement (n 216) 69.

source(s) of the information."[227] In turn, this would "unduly limit the right of the Defence under article 61(6)(b) of the Rome Statute to challenge the Prosecutor's evidence, a right to which the Appeals Chamber attached 'considerable significance.'"[228]

Notwithstanding the reasoning in *Gbagbo*, in the case of *Katanga and Ngudjolo,* Pre-Trial Chamber I re-affirmed the admissibility of anonymous hearsay evidence in the proceedings before the ICC.[229] In the *Confirmation of Charges*, the Chamber emphasized that "any challenges to hearsay evidence may affect its probative value, but not its admissibility."[230] Nonetheless, the Chamber was of the view that "the Parties may only use anonymous hearsay evidence to corroborate other evidence."[231]

Therefore, in cases where the OTP wishes to use satellite-based evidence to corroborate more traditional investigation methods, the Trial Chamber might consider the submission of anonymous hearsay acceptable.[232] Suppose, however, that the OTP intends to use satellite images as evidence of the offence upon which the charges are based or as evidence of the responsibility of the alleged perpetrator for the crimes committed.[233] In that case, it is not sufficient for the expert's testimony to be anonymous.[234]

Pursuant to the reasoning of the Court in *Gbagbo* and *Katanga and Ngudjolo*, the Trial Chamber could admit evidence documented by Earth Observation even in the absence of information about its origin.[235] That being said, the exact weight assigned to the evidence will vary. Whereas the Trial Chamber would accord greater evidentiary weight to satellite-based evidence that can indicate its source(s), it would accord less weight to expert testimony and imagery submitted without any details as to its origin or methodology.[236]

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[227] Prosecutor v. Callixte Mbarushimana (Judgment on the Appeal of the Prosecutor) ICC-01/04-01/10-514 (30 May 2012) para 40.
[228] Ibid.
[229] *Katanga and Ngudjolo* Confirmation of Charges (n 79) para 37.
[230] Ibid., 138.
[231] Ibid., 139.
[232] Purdy (n 203) 409.
[233] OHCHR (n 28) 27.
[234] Purdy (n 203) 409.
[235] *Gbagbo* Confirmation of Charges (n 212) para 27; *Katanga and Ngudjolo* Confirmation of Charges (n 79) para 37.
[236] *Katanga and Ngudjolo* Confirmation of Charges (n 79) para 37.

4.1.2 Provenance

At the ICC and the *Ad hoc* Tribunals, the judges examine provenance – also known as the chain of custody – to determine the credibility and authenticity of digital evidence.[237] The introduction of *Section Background* showed that satellite data moves through four critical stages.[238] At each stage, the data is vulnerable to alteration by (malicious) actors who can easily manipulate the information with no possibility of the Court or OTP detecting ex post facto changes.[239] Consequently, for the OTP to be able to rely on satellite-based evidence, there must be an auditable system in place that can link the chain of custody between each stage up until the image is presented to the Court.[240]

This process is classified as 'proportionate' as it grants the opposing Party the opportunity to verify or challenge how the image was processed and interpreted.[241] Should the OTP not be able to account for each phase of the data collection, production, and interpretation process, the Trial Chamber may consider there to be a significant transparency issue.[242] In turn, this could cause the judges to assign less weight to the evidence in the final judgment.[243]

Pre-Trial Chamber I in the *Lubanga* case noted that neither the Rome Statute nor the RPE "expressly state that the absence of information about the chain of custody or transmission affects the evidence's admissibility or probative value."[244] Consequently, a lack of provenance will generally not lead to the inadmissibility of satellite data. This is particularly the case if the opposing Party only raises a 'general objection' to the admissibility of the evidence but does not directly object to the fact that the provenance has not been clearly established.[245]

Although the absence of verifiable provenance is not a ground for the inadmissibility of evidence, it can be concluded from the Court's reasoning in *Lubanga* that the judges accord more weight to digital material when the OTP holds a secure electronic record of the processes

[237] *Blagojević and Jokić* Judgement (n 4) 29.
[238] Ginzky, *Satellite Images as Evidence in Legal Proceedings* (2000) 115.
[239] Ibid.
[240] Purdy and Leung (n 5) 200.
[241] Purdy (n 203) 409.
[242] Ibid.
[243] Ibid.
[244] Lubanga Confirmation of Charges (n 138) 96.
[245] Purdy and Leung (n 5) 200.

to which the data is subject.[246] Indeed, in the case of *Gombo,* the Trial Chamber declared that because the provenance had not been tested, the materials carried "little, if any, evidentiary weight."[247] For this reason, it is recommended that the OTP maintains verifiable records of the systems and individuals involved in each stage of the image production process.[248] Furthermore, should it be available, the OTP may consider having an accredited body certify the systems with a qualified electronic certificate as proof of the data provider's credibility.[249]

4.1.3 Inherent Indicia of Credibility

Satellite-based evidence has an inherent indicium of authenticity that the OTP may use to affirm the evidence's credibility.[250] In the *Gombo* Trial Judgement, the terminology "inherent Indicia of Authenticity" is used to describe Digitally Derived Evidence (DDE) that contains secondary information such as internal markers (e.g., metadata) and external factors (e.g., evidence captured by the Court's in-house experts).[251]

The metadata of DDE includes properties such as geolocation, time, and date, which the OTP or the Trial Chamber may use to corroborate the evidence's primary information.[252] For example, a satellite-image's metadata can corroborate that the image is a recording of a particular incident if, for instance, the metadata corresponds to the geolocation of the people or objects depicted therein.

In the *Gombo* case, the Trial Chamber assessed the credibility of the ICC Detention Centre communications and held that "some communications and logs do have inherent indicia of authenticity."[253] The factors the judges referred to in the *Abuse of Process* decision were the communication's corporate watermarks, metadata, and other forms of identification that are also inherently present in satellite-based evidence.[254]

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[246] Kay (n 10) 17.
[247] The Prosecutor v. Jean-Pierre Bemba Gombo (Decision on the Abuse of Process Challenges) ICC-01/05-01/08 (24 June 2010) 254.
[248] Kay (n 10) 17.
[249] Ibid.
[250] *Gombo* Abuse of Process (n 240) 219.
[251] Ibid., 220.
[252] Ginzky (n 6) 115.
[253] *Gombo* Abuse of Process (n 6) 219.
[254] Ibid., 219.

A 2009 study executed by a consortium of remote-sensing firms and ESA specified two key markers for securing the credibility of satellite-imagery.[255] The study suggested digitally 'sealing' geospatial data by incorporating a "legally recognized Digital Signature and a Trusted Timestamp into the data file(s) to prove the document's origin at the indicated date and time."[256] In effect, such a seal would enable the Court to identify whether any changes happened to the data file(s) since it was signed and time-stamped, thereby providing the Court with an additional guarantee of the trustworthiness and accuracy of the evidence.[257] Since the 2009 publication, several reputable remote-sensing firms, like IKONOS, QuickBird, and GeoEye, have offered the possibility of including such digital seals in their captured data.[258]

Thus, this Paper can conclude that before contracting a remote-sensing firm, the OTP should verify that the firm incorporated internal markers into the image(s), such as a Digital Signature or Trusted Timestamp. And suppose the image(s) are submitted to the Court by an unrelated third party. In that case, the OTP should affirm the credibility of the evidence by using the image's metadata and other external factors to corroborate the evidence's primary information.

4.1.4 Impartiality and Independence of the Source(s)

Prior to submitting satellite-imagery as evidence of criminal responsibility to the Court, the OTP should verify whether a commercial or State-owned satellite produced the image, the source's affiliation to the accused, and the methodology used to process and interpret the data.[259] Contingent on these factors, the opposing counsel might challenge the probative value of the image by raising concerns about the source's impartiality and independence.[260]

[255] Kay (n 10) 9.
[256] Ibid., 26.
[257] Ibid.
[258] Ibid., 27.
[259] Theresa (n 210) 113.
[260] Purdy (n 203) 409.

On the matter of impartiality, the *Gombo* Trial Chamber noted the following in relation to NGO reports:

> "Based on its review of the content of the reports under question, the Majority was satisfied that they offered satisfactory information on their sources of information and methodology, providing sufficient indicia of [credibility] to warrant their admission into evidence."[261]

The Trial Chamber in *Gombo* held the NGO reports to be impartial and credible because the Prosecutor provided the Court with sufficient information on the Report's authors and methodology.[262] Whilst this case raised questions about NGO reports, the Trial Chamber could raise similar questions about the impartiality of satellite-based evidence. Much like the reports, a range of commercial and government providers could produce satellite-imagery for the Court, each following their own methodologies.[263]

Some remote-sensing firms might, for example, have a political bias or be owned or influenced by a Party to the proceedings.[264] In particular, given the gravity of the crimes that fall within the Court's jurisdiction, it is probable that the accused will be a high-ranking state official.[265] In the event that the defendant's State-operated satellite captured images of the alleged incident, the OTP and the Trial Chamber should consider the possibility that the images are not impartial and have been altered or fabricated by the government in question.[266]

In assessing the impartiality and independence of the source(s), the decisive factors include, *inter alia,* the reputation of the remote-sensing firm and the Court's experience with the provider.[267] While some firms have a reliable history of accurately capturing and interpreting satellite data, others might be known for manipulating their images or having strong ties to a particular regime, network, or corporation.[268] These factors will be particularly salient when considering the impartiality and independence of the expert that must interpret the data on behalf of the Chamber or the witness that must corroborate the facts in the image.[269] In

[261] Gombo Abuse of Process (n 240) para 21.
[262] Ibid.
[263] Kay (n 10) 10.
[264] Ibid.
[265] Ibid.
[266] Ibid., 230.
[267] Kay (n 10) 235.
[268] Ibid., 200.
[269] Purdy (n 203) 413

Ngudjolo, for instance, the Trial Chamber accorded a lower evidentiary weight to a witness' testimony due to his violent behaviour throughout the proceedings and his previous refusal to appear before the Court.[270]

With satellite-based evidence, the reputation of the firm or expert, their commercial and political affiliation, or the Court's previous negative experience could have a detrimental effect on the credibility of the evidence.[271] It is, therefore, foreseeable that the Trial Chamber will accord more weight to the data captured by a remote-sensing firm that has previously provided the Court with accurate information over information from a firm with a history of altering or forging images.[272]

Indeed, to guarantee the credibility of the provider, the ICC OTP has established a bilateral agreement with organizations like the United Nations Satellite Centre and ESA.[273] Hence, this Paper can conclude that credibility will depend on the provider's industry-reputation, the methodology used to produce the image, and the formalized relationship of the Court with the international organization or the remote-sensing firm.

4.2 Rules Governing the *Reliability* of Other Types of Evidence

In order to determine the probative value of satellite-based evidence before it, the Court must evaluate both credibility and reliability.[274] Whereas credibility is concerned with the source of information, reliability "establishes whether a piece of evidence is what it purports to be."[275] In the ICTY case of *Kupreskic,* the judges distinguished the two concepts by highlighting that "even witnesses who are very sincere, honest and convinced about their identification are very often wrong."[276] Similarly, while a remote-sensing firm could satisfy all the credibility

[270] Prosecutor v. Mathieu Ngudjolo (Judgment pursuant to article 74) ICC-01/04-02/12 (18 December 2012) para 141.
[271] Kay (n 10) 200.
[272] Ibid.
[273] Macauley, *Use of EO Technologies in Court by the OTP of the ICC* (2021) 219.
[274] *Lubanga* Four Documents (n 61) 5.
[275] OHCHR (n 28) 18.
[276] *Kunarac* Motion for Acquittal (n 106) para 7.

requirements in *Section 4.1* Rules Governing the *Credibility* of Other Types of Evidence, the information could be unreliable if the facts it purports did not occur.[277]

There is little research on the conditions satellite-images must fulfil to be considered reliable enough to be admissible in the proceedings before the Court. Generally, to verify the reliability, the ICC prefers corroborating the evidence with external sources, including victim, witness, and expert testimony.[278] Other relevant factors the Court also examines are the entirety and accuracy of the information, the scientific standards used to interpret data, and conditions such as weather, geography, time, and equipment.[279]

4.2.1 Consistency Between the Data and Corroborating Evidence

When external evidence is consistent with the facts satellite-imagery asserts, the Trial Chamber should deem geospatial data reliable and accord due weight to it in the judgment on the proceedings.[280] In this respect, the ruling of Pre-Trial Chamber I in *Mbarushimana* reflects the value of corroboration in proceedings before the ICC.[281] Although the OTP in *Mbarushimana* based its allegations of War Crimes on NGO reports, the Chamber's reasoning is equally applicable to satellite-based evidence. According to Pre-Trial Chamber I:

> "Although no evidence was provided to the Chamber in relation to an attack against the civilian population in Busurungi (…) then based on the witness statements, read together with UN and Human Rights Watch Reports, the Chamber is satisfied that there are substantial grounds to believe that three women were found dead near Busurungi (…)."[282]

The general rule that emerges in the case of *Mbarushimana* is that the reliability of the reports, or any other piece of evidence, considerably improves when combined with witness statements or other corroborating material.[283] Indeed, this principle also holds in the converse. When corroborating witness testimony is absent, of low quality, or inconsistent with the evidence's

[277] OHCHR (n 28) 18.
[278] Macauley (n 268) 219.
[279] Ibid.
[280] Ibid.
[281] *Mbarushimana* Appeal Judgement (n 219) para 135.
[282] *Mbarushimana* Appeal Judgement (n 219) para 135.
[283] Kay (n 10) 10.

primary information, the Trial Chamber may consider this to adversely affect the reliability of the evidence in question.[284] In *Milutinovic,* for example, the ICTY Trial Chamber did not grant a video depicting the shelling of villages any weight as the corroborating witness testimony could not demonstrate with sufficient certainty when the Parties made the recording.[285]

Inconsistency may occur internally, i.e., a contradiction within the same data, or externally, i.e., when another piece of evidence contradicts the information within an image.[286] Generally, internal inconsistencies are the result of technical mistakes.[287] Such errors do not have to adversely affect the overall weight the Trial Chamber accords to a satellite image.[288] Particularly if it does not otherwise change the substance of the evidence or if the evidence is corroborated by credible witness/expert testimony.[289] On the other hand, various 'external' sources might provide information that contradicts the facts depicted in an image.[290] Should there be external contradictions, then the Chambers will have to assume that one of the sources is unreliable and re-assess the reliability of each piece of evidence.[291]

Following the reasoning of the ICC and ICTY, the reliability of satellite-based evidence could be enhanced if the Court has access to other evidence that it can use to check for consistency or potential inconsistency within the image.[292] Therefore, when there is a dispute over the accuracy of geospatial data, the OTP may rely on other 'reliable' material to reinforce the reliability of satellite-based evidence in the eyes of the Court.

4.2.2 Entirety and Accuracy of the Expert Testimony

As discussed in Chapter Chapter 2: The General Context of Admissibility of Evidence under Article 69 (4) and (7) of the Rome Statute, for evidence to be admissible to the proceedings before the Court under article 69(4) of the Rome Statute, the evidence must be relevant to the trial and have probative value. A noticeable limitation of Earth

[284] Ibid., 30.
[285] Prosecutor v. Milan Milutinovic et al. (Judgment) IT-05-87-T (26 February 2009) 896.
[286] Kay (n 10) 40.
[287] Ibid.
[288] Prosecutor v Popović et al (Judgement) IT-05-88-T (10 June 2010) 75.
[289] Ibid., 75.
[290] Kay (n 10) 43.
[291] Ibid.
[292] Ibid.

Observation, mentioned in *Section 2.1.1* Relevance, is that the presentation of satellite-based evidence to the Trial Chamber will generally require the testimony of a person with specific expertise or the submission of a technical report detailing 'all' the relevant information captured by the image.[293] This may include information only partly relevant to the matters before the Court.[294]

Consequently, when an expert interprets the image and presents the 'relevant' information to the Court, it should be assumed that the expert will omit specific details in their testimony.[295] Usually, however, expert testimony must be provided in as much detail as possible to convince the Trial Chamber that the expert's opinions are well-founded.[296] In the *Ngudjolo's* Trial Judgement, the Court pointed out the following:

> "With specific reference to the [expert] witnesses' reliability, the Chamber determined the probative value to be attached to the information provided. It took the entirety of their testimony into consideration, having regard to the capacity and quality of their recollection. It also considered whether there were indicia suggesting that [expert] witnesses may have been pressurised or influenced (…). To this end, the Chamber considered the consistency and precision of the accounts."[297]

Initially, the framework of the Trial Chamber in *Ngudjolo* proposes to place a greater emphasis on the level of detail of the expert's testimony.[298] The Chamber's reasoning shows, however, that the Court assesses the Expert's presentation against measures such as consistency, impartiality, and quality. Hence, depending on the purpose of the information, it should be acceptable for the Expert(s) to narrow down the detail(s) they provide without it affecting the reliability of their testimony.

4.2.3 Other Factors Affecting the Reliability of Satellite Imagery

[293] Kay (n 10) 17.
[294] Ibid.
[295] Ibid.
[296] Hola and Chlevickaite, *Empirical Study of Insider Witnesses' Assessments* (2016) 684.
[297] *Ngudjolo* Confirmation of Charges (n 79) para 53.
[298] Ibid.

An adequate reliability framework cannot be entirely deduced from the reliability requirements of other types of evidence. Certain aspects of Earth Observation will uniquely affect the reliability of satellite-imagery as evidence of criminal responsibility in the proceedings before the ICC. In addition to the factors cited throughout *Section 4.2 Rules Governing the Reliability of Other Types of Evidence*, the most salient are weather/location, temporal frequency, and satellite resolution.[299]

First, Earth Observation might be unreliable under particular conditions or in certain areas.[300] For instance, when refugee camps, supply routes, or victims are hidden in heavy forest cover or particularly cloudy conditions, Earth Observation will not be capable of monitoring these areas effectively.[301] That is not to say that satellites will be entirely unreliable, as remote-sensing firms can augment satellite-imagery with aerial data and PGS optical imagery.[302] However, persistent cloud cover and other conditions will considerably limit the choices of satellite systems available to the OTP.[303] For example, if the OTP wants to use Earth Observation to monitor potential crimes against humanity in Sudan, where the weather is especially arid, the only tools that might be available are multispectral or radar imagery.[304] Hence, the reliability of the documented geospatial evidence in Sudan or any other area will depend on the facts that need to be proven, the technology used, and the availability of different tools to augment the image.

Second, the OTP must decide on the temporal frequency of observation, i.e.., how often and for how long the satellite will take images of a specified area.[305] Depending on when the OTP commissions a remote-sensing firm and the frequency of observation, the OTP could use a satellite to monitor all the critical stages of the incident consistently, or there might be significant time gaps that will reduce the usefulness and, subsequently, the reliability of the evidence.[306]

[299] Kay (n 10) 38.
[300] Ibid.
[301] Ibid.
[302] Ibid., 39.
[303] Ibid., 40.
[304] Macauley (n 268) 219.
[305] Purdy (n 203) 399.
[306] Purdy (n 203) 399.

Finally, the choice of satellite resolution must be appropriate for recording the required information.[307] Whether the OTP decides on documenting a particular area using low, mid, or high-resolution systems will affect the data's reliability.[308] In making this selection, the OTP must consider the nature of the crime.[309] Typically, medium and high-resolution data will be necessary to monitor changes in population density, human displacement, and destruction of property.[310] In comparison, low-resolution images continuously track city-wide destruction and other large-scale events.[311] Therefore, the evidence's reliability will be contingent on the choice of satellite resolution and the facts sought to be proven.[312]

Chapter 5: Assessment of the Reliability, Credibility, and Admissibility of Satellite-Based Evidence

Coming back to the research question posed in *Section 1.2* Purpose and Research Question, there are several conclusions this Chapter must highlight. Firstly, it is necessary to emphasize that the OTP's initial evaluation of the evidence's credibility and reliability during the

[307] Macauley (n 268) 221.
[308] Purdy (n 203) 416.
[309] Kay (n 10) 216.
[310] Ibid.
[311] Ibid.
[312] Ibid.

proceedings' investigative stage does not occur in a vacuum. Instead, for satellite-images to be admissible as evidence of criminal responsibility in the trial stage, the OTP must first ensure that the evidence is *prima facie* relevant to the proceedings.[313] And second, the Prosecutor must weigh the probative value against the image's prejudicial effect.[314] Whilst the OTP should exclude any irrelevant images from the proceedings already in the investigative stage, it must subject the images relevant to the matters before the Court to a probative value assessment.[315]

Notwithstanding the Court's statement in *Lubanga* that "innumerable factors" collectively act as the determinants of probative value, the ICC, ICTY, and ICTR case-law firmly demonstrates that the main factors in assessing probative value are the indicia of credibility and reliability.[316]

Although the Trial Chamber and the OTP have considerable discretion to determine the admissibility of evidence in accordance with the procedure in article 69(4) of the Rome Statute, this discretion is subject to a separate (mandatory) standard on the exclusion of evidence in article 69(7) of the Rome Statute.[317] Because of the broad scope of violations encompassed in article 69(7), this Paper cannot exclude the possibility that Earth Observation might violate some rights that may affect the reliability of the evidence or the integrity of the proceedings.

Following the Trial Chamber's application of article 69(7) in *Lubanga,* this Paper can conclude that it is improbable that any Rome Statute or human rights violation falling within the scope of article 69(7) could cast substantial doubt on the reliability of satellite-based evidence. This is because the data that Earth Observation captures will not change whether an investigation does or does not fully adhere to a person's human rights.[318] Similarly, this Paper can conclude from the use of Earth Observation in the jurisprudence of the ECtHR and ICTY that it is unlikely for the ICC Trial Chamber to rule satellite-imagery to be "antithetical to" and "seriously damage the integrity" of the proceedings.

Instead, the ICC case law points out several other credibility and reliability factors that the OTP must consider while determining whether an image complies with the Rome Statute's

[313] *Lubanga* Four Documents (n 61) 5.
[314] Ibid.
[315] Ibid.
[316] Ibid., 16.
[317] Gosnell (n 108) 385.
[318] Purdy and Leung (n 5) 20.

procedural rules on the admittance of evidence. For example, the image's credibility will depend on whether the Court has access to information about the provider's origin and methodology.[319] In this regard, it is imperative that the OTP holds a verifiable record of the systems and individuals involved in each stage of the image production process.[320] Without this information, the Trial Chamber cannot accurately evaluate the source's credibility, thereby considerably lowering the evidence's weight and probative value.[321]

On the other hand, when the relevant Party does indicate the image's source, the OTP can evaluate different credibility factors. Given the gravity of the crimes that fall within the Court's jurisdiction, it is probable that the accused will be a high-ranking State official whose government may have captured and produced its own images of the alleged incident.[322] In such situations, the OTP can challenge the source's credibility on the grounds of impartiality and independence.[323] Similarly, the source's reputation and prior conduct before the Court may factor into the image's credibility assessment.[324] Finally, credibility will also be affected by absence of internal markers that can corroborate the purported facts.[325]

To determine the image's reliability, the Trial Chamber generally corroborates the evidence with external sources that it can use to check for consistency or potential inconsistency within the image.[326] Consequently, to ensure that the Chamber accords to the image due weight in the judgment on the proceedings, the OTP will have to rely on victim, witness, or expert testimony and other 'reliable' material to reinforce the image's reliability in the eyes of the Court.[327]

Moreover, certain aspects of Earth Observation uniquely affect its reliability. Among the most salient factors include the weather and geographic conditions of the area in question, how often and for how long the OTP decides to monitor a pre-specified location, and whether the OTP chooses the appropriate satellite resolution for the facts sought to be proven.[328]

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[319] *Gbagbo* Admissibility Decision (n 83) para 27.
[320] Kay (n 10) 17.
[321] Ibid.
[322] Kay (n 10) 10.
[323] Ibid.
[324] Ibid.
[325] Gombo Abuse of Process (n 240) 219.
[326] Macauley (n 268) 219.
[327] Ibid.
[328] Kay (n 10) 38.

In light of all the procedural requirements discussed, this Paper concludes that the admissibility of satellite-imagery is contingent on a comprehensive evaluation that takes place in a step-by-step process. Hence, only if the image meets the positive assessment set out in article 69(4) of the Rome Statute and the image is not excluded because of the conditions in article 69(7) of the Rome Statute will the Trial Chamber admit the image as evidence of international criminal responsibility in the proceedings before the Court.

Nonetheless, this Paper must stress that the Rome Statute, the RPE, and the ICC case-law consistently maintain that it is up to the Trial Chamber to freely assess "all evidence submitted to it to determine its relevance or admissibility."[329] Also, in performing its functions during the course of a trial, the Chamber always reserves the power to "order the production of any evidence(…)" it considers necessary to establish the truth.[330] This means that notwithstanding the general reliability and credibility rules in the case law, the Trial Chamber always retains the discretion to reach a different conclusion depending on the facts of the case.

Considering the highly beneficial nature of Earth Observation to the OTP's time-sensitive and high-risk investigations, the Prosecutor must have a reliability and credibility framework in its possession against which it may evaluate the admissibility of satellite-based evidence. This thesis has shown that the OTP may derive relevant rules from general ICC case law to guide its preliminary assessment. However, how the Trial Chamber accords weight to the evidence in the future jurisprudence will determine whether Earth Observation becomes a standardized investigation approach of the OTP or whether it continues to serve predominantly as corroborating material.

Bibliography

A. Decisions

International Criminal Court

[329] Rome Statute (n 44) article 64(d).
[330] Rome Statute (n 44) article 69(3).

The Prosecutor v. Ntaganda (Judgement) ICC-01/04-02/06-2359 (8 July 2019)

The Prosecutor v. Bosco Ntaganda (Decision on Prosecution's Request for Admission of Documentary Evidence) ICC01/04-02/06-1838 (28 March 2017)

The Prosecutor v Admad Al Faqi Al Mahdi (Transcript Trial Hearing) ICC-01/12-01/15-T-4-Red-ENG (22 August 2016)

The Prosecutor v. Germain Katanga (Decision on the Review Concerning Reduction of Sentence of Mr Germain Katanga) ICC-01/04/01/07 (13 November 2015)

The Prosecutor v. Jean-Pierre Bemba Gombo (Decision on the Admission into Evidence of Items Deferred in the Chamber's "Decision on the Prosecution's Application for Admission of Materials into Evidence Pursuant to Article 64(9) of the Rome Statute") ICC-01/05-01/08-2299 (27 June 2013)

The Prosecutor v. Laurent Gbagbo (Decision Adjourning the Hearing on the Confirmation of Charges Pursuant to Article 61(7)(c)(I) of the Rome Statute) ICC-02/11-01/11-432 (03 June 2013)

The Prosecutor v. Mathieu Ngudjolo (Judgment Pursuant to Article 74 of the Statute) ICC-01/04-02/12 (18 December 2012)

The Prosecutor v. Callixte Mbarushimana (Judgment on the appeal of the Prosecutor Against the Decision of Pre-Trial Chamber I of 16 December 2011) ICC-01/04-01/10-514 (30 May 2012)

The Prosecutor v. Callixte Mbarushimana (Decision on the Confirmation of Charges) ICC-01/04-01/10 (16 December 2011

The Prosecutor v. Katanga and Ngudjolo Chui *(*Decision on the Bar Table Motion of the Defence of Germain Katanga) ICC-01/04-01/07-3184 (21 October 2011)

The Prosecutor v. Jean-Pierre Bemba Gombo (Decision on the Admissibility and Abuse of Process Challenges) ICC-01/05- 01/08 (24 June 2010)

The Prosecutor v. Thomas Lubanga Dyilo (Decision on the Admission of Material from the Bar Table) ICC-01/04-01/06 (24 June 2009)

The Prosecutor v. Omar Hassan Ahmad Al-Bashir (Decision on the Prosecution's Application for a Warrant of Arrest) ICC-02/05-01/09 OA2 (4 March 2009)

The Prosecutor v. Germain Katanga and Mathieu Ngudjolo Chui (Decision on the Confirmation of Charges) ICC-01/04-01/07 (30 September 2008)

The Prosecutor v. Thomas Lubanga Dyilo (Decision on the admissibility of four documents) ICC 01/04-01/06 (13 June 2008)

The Prosecutor v. Thomas Lubanga Dyilo (Decision on Confirmation of Charges) ICC-01/04-01/06 (29 January 2007)

International Tribunal for the Former Yugoslavia

The Prosecutor v Tolimir (Judgement) IT-05-88/2-T (12 December 2012)

The Prosecutor v. Radovan Karadžić, (Decision on the Accused's Motion to Exclude Intercepted Conversations), ICTY TC III (30 September 2010)

The Prosecutor v Popović et al (Judgement) IT-05-88-T (10 June 2010)

The Prosecutor v. Milan Milutinovic et al. (Judgment) IT-05-87-T (26 February 2009)

The Prosecutor v. Vidoje Blagojević and Dragan Jokić (Trial Judgment) IT-02-60-T (17 January 2005)

The Prosecutor v. Stakic´, (Provisional Order on the Standards Governing the Admission of Evidence and Identification) IT-97-24 (25 February 2002).

The Prosecutor v. Dragoljub Kunarac et al (Decision on Motion for Acquittal) (3 July 2000)

The Prosecutor v. Zlatko Aleksovski (Decision on Prosecutor's Appeal on Admissibility of Evidence) (16 February 1999)

The Prosecutor v Zejnil Delalic (Decision on the Motion of the Prosecution for the Admissibility of Evidence) (19 January 1998)

International Tribunal for Rwanda

The Prosecutor v. Édouard Karemera et al (Decision on Joseph Nzirorera's Appeal of Decision on Admission of Evidence Rebutting Adjudicated Facts) ICTR98-44-AR73.17 (29 May 2009)

The Prosecutor v. Alfred Musema (Judgment and Sentence) ICTR-96-13-A (27 January 2000)

Court of Justice of the European Union

Digital Rights Ireland Ltd v. Minister for Communications and Others (Judgement of the Court) CJEU C-293/12 and C-594/12 (8 April 2014)

European Court of Human Rights

A. v. France, (Judgment) ECHR 14838/89 (23 November 1993)

Klass and Others v. Germany (Judgment) ECHR 5029/71 (6 September 1978)

B. Treaties

The United Nations Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2001) No. 38544 (Rome Statute)

International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171 (ICCPR)

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (Adopted 27 January 1966, entered into force 10 October 1967) RES 2222 (XXI) (Outer Space Treaty)

European Convention on Human Rights (adopted 4 November 1950, entered into force 2 September 1953) 4.XI (ECHR)

C. Documents

OHCHR, 'Berkeley Protocol on Digital Open-Source Investigations' (2020)

Research Division Council of Europe, 'National security and European case-law' (2013) Council of Europe and European Court of Human Rights

UNHCR, 'Policy on the Protection of Personal Data of Persons of Concern to UNHCR' (2015) UNHCR

UNGA, 'Principles Relating to Remote Sensing of the Earth from Outer Space: Resolution' (1987) GAOR, 41st Session Supp 53

UN Preparatory Committee on the Establishment of an International Criminal Court, 'Decisions taken by the Preparatory Committee at its session held from 1 to 12 December 1997' A/AC.249/1997/L.9/Rev.1 (18 December 1997)

D. Books

Ambos K, *Treatise on International Criminal Law: International Criminal Procedur*e, vol 3 (OUP, 2016)

Gosnell C, 'Admissibility of Evidence' in Khan K, Buisman C, and Gosnell C (eds), *Principles of Evidence in International Criminal Justice* (1 edn, OUP 2010)

Purdy R and Leung D, *Evidence from Earth Observation Satellites: Emerging Legal Issues* (Martinus Nijhoff, 2012) Brill

Triffterer O and Ambos K, *Rome Statute of the International Criminal Court Article-by-Article Commentary* (3rd edn, Bloomsbury Publishing 2021)

E. Websites

Amnesty International, 'The story behind the Nigeria satellite images' (2015) Amnesty International <www.amnesty.org/en/latest/news/2015/01/the-story-behind-the-nigeria-satellite-images/> accessed 28 January 2022

'How the ICC Works' (ICC). <how-the-icc-works.aba-icc.org> accessed 25 January 2022

Pierro R, 'Satellite Imagery for Human Rights Monitoring' (2022) The Engine Room < https://library.theengineroom.org/satellite-imagery-human-rights/> accessed 3 March 2022

F. (Online) Articles and Journals

Arsha H and Others, 'Digital Forensics: Review of Issues in Scientific Validation of Digital Evidence' (April 2018) Journal of Information Processing Systems <https://www.researchgate.net/publication/327644306_Digital_Forensics_Review_of_Issues_in_Scientific_Validation_of_Digital_Evidence> accessed 10 June 2022

Ashouri A, Bowers C, Warden C, 'An Overview of the Use of Digital Evidence in International Criminal Courts' (2014) University of London

Chaturvedi S, 'Satellite Imagery in International Human Rights Litigation' (8 January 2015) National Law Institute University <https://www.aaas.org/news/satellite-imagery-international-human-rights-litigation> accessed 9 June 2022

Ginzky H, 'Satellite Images as Evidence in Legal Proceedings Relating to the Environment a US Perspective' (2000) Air and Space Law < https://www.persee.fr/doc/drevi_0396-4841_2001_num_51_1_1765> accessed 12 June 2022

Gosnell C, 'The Changing Context of Evidential Rules' (15 January 2010) ICC Forum < https://iccforum.com/forum/permalink/122/33564> accessed 15 April 2022

Heinsch R, Irving E, and Others, 'Report on Digitally Derived Evidence in International Criminal Law' (June 2019) Kalshoven-Gieskes Forum on International Humanitarian Law <https://leiden-guidelines.netlify.app/assets/DDE%20in%20ICL.pdf> accessed 5 June 2022

Herscher A, 'Surveillant Witnessing: Satellite Imagery and the Visual Politics of Human Rights' (2014) Duke University Press < https://read.dukeupress.edu/public-culture/article-abstract/26/3%20(74)/469/85786/Surveillant-Witnessing-Satellite-Imagery-and-the?redirectedFrom=fulltext> accessed 10 February 2022

Hola V and Chlevickaite G, 'Empirical Study of Insider Witnesses' Assessments at the International Criminal Court' (2016) International Criminal Law Review < https://research.vu.nl/en/publications/empirical-study-of-insider-witnesses-assessments-at-the-internati> accessed 15 April 2022

Kay J and Others, 'Evidence from Space Study for the European Space Agency on Use of Space-Derived Earth Observation Information as Evidence in Judicial and Administrative Proceedings' (2012) ESA < https://www.space-institute.org/app/uploads/1342722048_Evidence_from_Space_25_June_2012_-_No_Cover_zip.pdf> accessed 10 December 2021

Kroker P, 'Satellite Imagery as Evidence for International Crimes' (2015) International Justice Monitor < https://ciccglobaljustice.wordpress.com/2015/04/23/satellite-imagery-as-evidence-for-international-crimes/> accessed 10 May 2022

Lang S and others, 'Earth observation tools and services to increase the effectiveness of humanitarian assistance' (2020) European Journal of Remote Sensing < https://www.tandfonline.com/doi/full/10.1080/22797254.2019.1684208> accessed 14 February 2022

Laving L, 'The Reliability of Open-Source Evidence in the International Criminal Court' (2014) Lund University <https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=4457910&fileOId=4459912> accessed 20 December 2021

Lichtman A, Nair M, 'Humanitarian Uses of Drones and Satellite Imagery Analysis: The Promises and Perils' (2015) AMA Journal of Ethics <https://journalofethics.ama-assn.org/article/humanitarian-uses-drones-and-satellite-imagery-analysis-promises-and-perils/2015-10> accessed 17 December 2021

Macauley E, 'The Use of EO Technologies in Court by the Office of the Prosecutor of the International Criminal Court' (2021) EBSCO Publishing < https://brill.com/view/book/edcoll/9789004234031/B9789004234031-s012.xml> accessed 23 February 2021

Mosteshar S, 'EO in the European Union: Legal Considerations' (7 June 2022) BRILL <https://www.researchgate.net/publication/301557449_EO_in_the_European_Union_Legal_Considerations> accessed 22 February 2022

Nuñez A, 'Admissibility of Remote Sensing Evidence Before International and Regional Tribunals', (2012) Amnesty International < https://www.amnestyusa.org/pdfs/RemoteSensingAsEvidencePaper.pdf> accessed 1 June 2022

Piragoff D and Clarke P, 'Article 69 Evidence, in The Rome Statute of the International Criminal Court: A Commentary' (14 January 2016) paywall <www.ICCforum-cpi.int/sites/default/files/RelatedRecords/CR2016_01081.PDF> accessed 10 March 2022

Purdy R, 'Pulling the Threads Together and Moving Forward' (2021) EBSCO Publishing

Raymond N and others, 'While We Watched: Assessing the Impact of the Satellite Sentinel Project' (2013) 14(2) Georgetown Journal of International Affairs < https://www.georgetownjournalofinternationalaffairs.org/online-edition/while-we-watched-assessing-the-impact-of-the-satellite-sentinel-project-by-nathaniel-a-raymond-et-al> accessed 19 March 2022

Ridderhof R, 'Satellite Data in International Law' (2017) Peace Palace Library <peacepalacelibrary.nl/blog/2017/satellite-data-international-law> accessed January 31, 2022

Sandalinas J, 'Satellite Imagery and Its Use as Evidence in the Proceedings of the International Criminal Court' (2015) 64 ZLW 666 <https://heinonline.org/HOL/LandingPage?handle=hein.journals/zlw64&div=53&id=&page=> accessed 3 June 2022

Schomburg W and Nemitz J, 'International Criminal Courts and Tribunals, Procedure' (February 2019) Max Planck Encyclopaedia of International Law < https://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e1678> accessed 27 March 2022

Soliman A, 'Admissibility of Illegally Obtained Cyber Evidence at the ICC', (31 May 2020) ICC Forum < https://iccforum.com/forum/permalink/122/33564> accessed 26 March 2022

Theresa L and Others, 'Geospatial Evidence in International Human Rights Litigation' (2018) American Association for the Advancement of Science < https://www.aaas.org/resources/geospatial-evidence-international-human-rights-litigation-technical-and-legal> accessed 4 June 2022

Williams M, 'Satellite Evidence in International Institutions' (6 July 2022) BRILL <https://brill.com/view/book/edcoll/9789004234031/B9789004234031-s011.xml?language=en> accessed 23 February 2022