COMMERCIAL SUBORBITAL FLIGHTS - AIR OR SPACE LAW?

Izvorni znanstveni rad

UDK 338.48:629.78(4EU:73)
347.82(4EU:73)
347.85(4EU:73)
340.5

Primljeno: 14. svibnja 2021.

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The concept of commercial suborbital flights cannot be established while we still lack two fundamental things: a definition of suborbital flight, and legal regulation of this phenomenon. When attempting to determine whether air or space law should govern commercial suborbital flights, due to the non-existent delimitation between airspace and outer space, we face several questions that need to be resolved. These questions are considered through both spatialist and functionalist approaches, which are further used to discern whether commercial suborbital flights fall under the scope of air or space law.

In this context, in this paper we aim to consider the broader picture, analysing existing regulation and the work of regulatory bodies in the EU and US.

In conclusion, we suggest a new sui generis approach to commercial suborbital flights in international law, possibly through the ICAO with the support of UNCOPUOS, and the creation of a separate convention to address commercial suborbital flights as a special category.

Ključne riječi: commercial suborbital flights, international air law, international space law, space tourism, delimitation of space

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List of abbreviations

ARHV	Airborne Reusable Hypersonic Vehicle
AST	The Office of Commercial Space Transportation
CSLAA	Commercial Space Launch Amendments Act
EASA	European Aviation Safety Agency
EPAS 2020-2024	European Plan for Aviation Safety (2020-2024)
EU	European Union
ESA	European Space Agency
FAA	Federal Aviation Administration
FAST20XX	Future High-Altitude High-Speed Transport 20XX
ICAO	International Civil Aviation Organization
NASA	National Aeronautics and Space Administration
UNCOPUOS	United Nations Committee on the Peaceful Uses of Outer Space
UNOOSA	United Nations Office for Outer Space Affairs
US	United States of America
SARPs	Standards and Recommended Practices
SoA	Suborbital Aeroplanes
SoWG	Suborbital Working Group
TFEU	Treaty on the Functioning of the European Union

The one use of aerospace that strikes closest and most directly

to the heart of the general public is transportation … The supersonic and hypersonic transports will be followed eventually by routine flights in space.

Dr. Edward C. Welsh, Executive Secretary of the National Aeronautics and Space Council,
Address before New York Academy of Sciences, 11 January 1965

1. INTRODUCTION

The development of space technologies is happening so fast that before we know it new purposes and applications of these technologies are discovered. But what is important for lawmakers and end users is that many of these purposes include the operation of commercial suborbital flights. Whether they are marketed as *space* tourism or simply as a new mode of transportation, their time is coming. And although we can distinguish different modes of suborbital flight, these should be irrelevant for the purpose of finding an applicable legal regime.[1] A particular problem is the lack of regulation regarding suborbital flight. The technology is on the verge of being used on a daily basis by certain companies, but legal provisions governing these operations are inconsistent and unclear, and what is more, non-existent for some related questions.

This is why this paper will attempt to address the problems facing lawmakers and regulatory bodies while considering the issue of suborbital flights, primarily the question of whether these kinds of flight fall under the scope of either air law or space law, or possibly both, since at the moment there is a complete lack of a special legal regime for this type of transport.

2. DEFINITION OF SUBORBITAL FLIGHTS

The International Civil Aviation Organization[2] (ICAO) Working Paper C-WP/12436 30/05/05, drawing on US legislation for some important elements of the definition, defined suborbital flight (in an untypical solution), as follows: "A sub-orbital flight is a flight up to a very high altitude which does not involve sending the vehicle into orbit. It should be noted that 'sub-orbital trajectory' is defined in the legislation of the United States as (49 U.S.C. § 70102 (20) (2004)) 'The intentional flight path of a launch vehicle, re-entry vehicle, or any portion thereof, whose vacuum instantaneous impact point does not leave the surface of the Earth'".[3] The ICAO Working Paper has been reviewed by the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), [4] after which no change in the regulation of commercial suborbital flights has been made. It is important to note that the definition provided here is not to be construed as a formal one to be observed by ICAO's Member States.

[1] E.g. we can use suborbital flight for the transport of people from one point on Earth to another, but also for a short flight in which a passenger can experience zero gravity for a few minutes.
[2] ICAO is the United Nations specialized agency established by States in 1944 to manage the administration and governance of the Chicago Convention. Through its work, ICAO serves as an organization whose objective is to provide civil aviation with uniform standards and regulation in all issues related to international air navigation (see Art. 37 of the Chicago Convention, which does not contain a closed list of matters, but leaves it open to ICAO to adopt or amend also "other matters concerned with the safety, regularity, and efficiency of air navigation".
[3] ICAO Council, Concept of Suborbital flights, Working paper, C-WP/12436, 30/05/2005, at 2.
[4] UNCOPUOS, Legal Subcommittee, Concept of Suborbital Flights: Information from the International Civil Aviation Organization (ICAO), Forty-ninth session 22 March -1 April 2010, A/AC.105/C.2/2010/CRP.9.

Many legal authors, while possibly agreeing with this definition, find it difficult to discern the important features to be able to formulate the legal conclusions required for the regulation of suborbital flights.[5] While certain effort is being made at the international level to create a definition of suborbital flight, the European Union (EU) is still in the process of formulating one. The EU has so far postponed all work regarding the regulation of suborbital flights, finding this matter not to be "a priority in the rulemaking programme of EASA"[6] only a couple of years ago.[7] However, in the meantime, suborbital flights have become a reality with calls for regulation coming from private entities. Constantly reminded by EASA, the EU has become aware of this demand and recognizes it.[8] Nevertheless, no work was done until recently, when EASA listed suborbital flights in its European Plan for Aviation Safety (EPAS 2020-2024)[9] for the first time, prompting the EU to recognize their importance and the urgent need for their regulation. In 2019, at the European Higher Airspace Operations Symposium, more than 160 participants from 33 countries (including some non-EU countries) "considered inviting" EASA and EUROCONTROL with the support of national experts, the European Defence Agency and the SESAR Joint Undertaking, to launch preparatory work for definitions of the regulatory framework and the European concept of operations.[10] In its latest, revised Plan (EPAS 2021-2025), EASA emphasizes this regulatory gap for operations in "higher airspace" (HA) again, calling for a definition of HA limits (upper and lower) as the most relevant at the moment, together with defining the concept of operations (in HA).[11]

On the other side of the Ocean, in the United States of America (US), the situation is quite different. The US regulates this kind of activity and most companies which organize suborbital flights are based there. One of them is *Virgin Galactic* whose May 2020 test

[5] Van Fenema, P., Suborbital Flights and ICAO, Air and Space Law, Vol. 30, Issue 6, 2005, pp. 396-411, at 397.
[6] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions EU Space Industrial Policy releasing the potential for economic growth in the space sector, COM/2013/0108 final, at 14.
[7] EASA's primary mission is to achieve the highest common level of safety protection and environmental protection, a single regulatory and certification process among Member States, facilitate the internal aviation single market, and work with other international aviation organizations and regulators on these matters. EASA consists of the EU Member States and Switzerland, Norway, Iceland and Liechtenstein. Under the Basic Regulation, EASA drafts basic standards, which are then adopted by the European Commission as regulations. These govern design, production and maintenance of aircraft, operations of aircraft, air crew and licensing, traffic management, navigation services and airports and aerodromes. See Regulation 2018/1139, OJ L 212, 22.8.2018, pp. 1–122.
[8] "Some European industry stakeholders are calling upon the EU to put in place a stricter regulatory framework, with adequate certification rules derived from aeronautic best practice, to better guarantee passenger safety. Industry representatives argue that the predictability of the regulatory framework is key for private investors, since it will drive the technology used and development activities. Other European stakeholders are calling upon the EU to put in place a more innovation-friendly regulatory framework." Ibid.
[9] EASA, European Plan for Aviation Safety (EPAS 2020-2024), 2019.
[10] Symposium Conclusions, available at https://www.eurocontrol.int/sites/default/files/2019-07/2019-04-09-ehao-symposium-conclusions.pdf (last visited 28.2.2021).
[11] EASA recognizes the operations of several types of aircraft that will take place in the HA in the future, including balloons, airships and high-velocity vehicles, both manned and unmanned. See EASA, The European Plan for Aviation Safety (EPAS 2021-2025), Vol. 1, at 42, available at https://www.easa.europa.eu/sites/default/files/dfu/epas_2021_2025_vol_one_final.pdf (last visited 28.2.2021).

flight demonstrated the huge progress made towards the goal of offering commercial services.[12] Another US-based company, *Blue Origin*, is already launching payloads of all sorts, mostly used by scientists, and performing suborbital flights on its ship called *New Shepard.* They expect to be able to provide commercial flights that will allow them to host passengers in the near future[13] – the future now being "really close".[14] Many more are listed on the National Aeronautics and Space Administration (NASA)[15] page as commercial suborbital providers.[16] However, this list is not exhaustive, because it covers only US-based companies.

Although the EU lacks regulation for suborbital flights, attempts at carrying out flights are happening in Europe as well. One of them is a project called *The Student Aerospace Challenge,*[17] which will involve several teams, including one for legal aspects. The project's goal is to launch a vehicle from a commercial aircraft to the limits of space.[18] But more than this, recent regulatory preparations and actions taking place throughout Member States show that the time for suborbital flights has come. Moreover, EASA has also submitted to the European Commission several options to allow suborbital flights in the EU.[19]

Although not one flight has actually been carried out, the potential value of the market for commercial suborbital flights has reportedly gone through the roof: by 2016, for example, Virgin Galactic alone had already sold 700 tickets at $250,000 for such a flight.[20] So, what amount of investments and market range are we to expect once suborbital flights take off? In this context, one should consider the possibilities of the technological development of

[12] At first, it would be spaceflights as space tourism, and later travelling across the globe as a mode of transport. See Virgin Galactic, https://www.virgingalactic.com/articles/virgin-galactics-spaceshiptwo-completes-first-flight-from-spaceport-america/ (last visited 28.2.2021).
[13] Blue Origin, https://www.blueorigin.com/fly-with-us/ (last visited 28.2.2021).
[14] After launching a new model of Blue Shepard in January 2021, the company expects to fly people really soon. See Foust, Jeff, 'Blue Origin launches New Shepard vehicle intended for crewed flights', Space News (14 January 2021) at https://spacenews.com/blue-origin-launches-new-shepard-vehicle-intended-for-crewed-flights/ (last visited 28.2.2021).
[15] NASA is the United States Federal Government independent agency commissioned to execute space research, aeronautics and the civilian space programme. It was established in 1958 by the National Aeronautics and Space Act. NASA's vision is to uncover and expand knowledge for the benefit of humanity.
[16] NASA, https://www.nasa.gov/directorates/spacetech/flightopportunities/flightproviders (last visited 29.5.2020).
[17] The Student Aerospace Challenge, http://www.studentaerospacechallenge.eu/index.php/en/the-challenge/origins-of-the-vsh-project (last visited 29.1.2021).
[18] "'Spaceplane', the VSH student challenge project to develop a suborbital manned airborne 44 VSH project is part of the Aerospace Student Challenge, which allows teams of European students, through collaborative work, to participate in the development of the project by addressing various aspects of the VSH system: propulsion, avionics, flight simulation but also maintenance, management, legal aspects, etc. while complying with the overall technical framework of the VSH. The name stands for VEHRA (*Véhicule Hypersonique Réutilisable Aéroporté*) Suborbital Habité, or Suborbital Manned ARHV (Airborne Reusable Hypersonic Vehicle), and the vehicle will be launched from a commercial aircraft, which will reach Mach 3.5 and an altitude of 100 km, the limits of space." See EPAS 2020-2024, *supra* note 9.
[19] See Ammeloot, J.-L.; Marciacq, J-B., "Accommodating Sub-orbital and Orbital Aircraft (SOA) flights in the EU", Briefings to the ICAO Air Navigation Commission (ANC) and ICAO Council, 21 October 2013, Montreal.
[20] Crane, K.W. et al., *Market Analysis of a Privately Owned and Operated Space Station*, Institute for Defense Analyses, 2017, at 16.

suborbital flights, and the amount of funding they can attract to continue further research and spacefaring. If we are to believe academics with economic or engineering backgrounds, it will finance itself through its growth.[21]

Suborbital flights could be used for space tourism or as a substitute for ultra-fast flights between two locations on Earth.[22] However, these flights will probably be for both tourism and travel. As was emphasized by Atcliffe, senior lecturer in aeronautical engineering at the University of Salford, Manchester, one problem with suborbital flight is that "by its very nature, it's tangled up with spaceflight, space tourism, hypersonic flight and so on, and it can be difficult to separate one from the other – if, indeed, they can be separated".[23] Therefore, the need for obtaining answers and regulating matters with regard to commercial suborbital flights is only growing and should be properly addressed.

3. CURRENT REGULATION OF SUBORBITAL FLIGHTS

There is still no specific international regulation for suborbital flights, including commercial suborbital flights. Therefore, in this section we will consider both air law conventions and space law conventions to see if suborbital flights could fall under the scope of either of these.

Leaving aside the non-existence of international regulation, there are certain national legal orders in which the suborbital flight market is regulated, with the US being at the forefront. The US Congress has accepted the development of new technology that can be used for commercial human suborbital flights and has amended current regulation to enable its application. The Commercial Space Launch Amendments Act (hereinafter: CSLAA) was passed in 2004, and included some important updates, such as recognition of human space flight as an industry distinct from commercial payload launches; amended definitions on launch vehicles, re-entry, and flight participants; and licensing requirements for experimental and operational permits.[24] As a result of these amendments, the US has a law that governs all commercial space launch activities, with the particular inclusion of suborbital spacecraft and human flight activities.[25] It is notable

[21] As Weinzerl puts it: "One can imagine a self-reinforcing virtuous cycle of development that would support the space economy. For example, cheaper and more frequent rocket launches might facilitate short-term tourism, along with industrial and scientific experimentation on suborbital and orbiting spacecraft. If these activities become routine, demand might rise for commercial habitats to support longer flights". See Weinzerl, M., *Space, the Final Economic Frontier*, The Journal of Economic Perspectives, Vol. 32, No. 2, 2018, pp. 173-192, at 184.

[22] "Previously the stuff of science fiction, sub-orbital flight would let you travel from one side of the planet to the other in less than an hour. On a London to Sydney trip, it would be difficult to squeeze in an in-flight meal, let alone a Hollywood action film" – excerpt from *Forget Supersonic, the Future of Super-Fast Flight Is Sub-Orbital*, Wired, 2018, available at: https://www.wired.co.uk/article/sub-orbital-flight-virgin-galactic-blue-origin (last visited 27.2.2021).

[23] Ibid.

[24] See Langston, S. M., *Suborbital Flights: A Comparative Analysis of National and International Law*, Journal of Space Law, vol. 37, no. 2, 2011, pp. 299-392, at 328. The Act was first enacted in 1984.

[25] See 51 U.S.C., Chapter 509 (Commercial Space Law Activities), 2012. For more on the regulation of spaceflights under the CSLAA, see Israel, A., *Reconsidering the Legal and Institutional Challenges: A New*

that ICAO decided to use some provisions of US law when creating the definition of suborbital flight.[26] Besides the US, regulatory work on suborbital flights is happening in the United Kingdom, where the Space Industry Act was enacted in 2018.[27] Some other states, including EU Member States like France, Germany, Netherlands, Spain, Sweden, as well as others including Australia, Canada, China, Japan, India, Brazil, etc., are also regulating space activities, but their rules are not being made directly applicable to suborbital flights.[28] Issues that mostly concern these lawmakers include the registration of space objects and the licensing of operations, as well as liability for damage and insurance matters. However, they do not touch upon the basic premise – defining a suborbital flight, which could help us solve jurisdictional problems of this type of transport operation.

3. 1. Execution of suborbital flights

A project called *Future High-Altitude High-Speed Transport 20XX* (hereinafter: *FAST20XX*) was part of the European Commission's Seventh Framework Programme, and run on behalf of the Commission by the European Space Agency (ESA).[29] The purpose of *FAST20XX* was to identify the technology crucial for suborbital vehicles, but it did not focus on the production of the technology itself. Aside from technical know-how, *FAST20XX* noted the most important issues for commercial suborbital flights – safety, environmental impact, medical impact on the human body, and legal issues.[30] *FAST20XX* described two concepts of suborbital flights – ALPHA and Space Liner – the former being a vehicle that is air-launched from a carrier plane before igniting a hybrid rocket motor to climb out of the atmosphere, and finally gliding back to Earth (like the well-known X-Prize winner SpaceShipOne),[31] and the latter as an all-rocket powered design which would transport about 50 people across long distances in an extremely short time; this is seen as taking place in the longer term, in the second part of this century.[32]

Apart from this, EASA has also reached some sort of definition of one of various suborbital technologies, namely suborbital aeroplanes (SoA).[33] EASA has established the Suborbital

Approach to Suborbital Flights (thesis, LL.M. in Space, Communication and Media Law, University of Luxembourg, Faculty of Law, Economics and Finance, 2019) at 10-12.

[26] See *supra* note 3.

[27] Space Industry Act 2018, 15 March 2018, available at https://www.legislation.gov.uk/ukpga/2018/5/introduction (last visited 28.02.2021).

[28] See Dempsey, P.S., *National Laws Governing Commercial Space Activities: Legislation, Regulation & Enforcement*, Northwestern Journal of International Law and Business, vol. 36, no. 1, 2016, at p. 16 ff. For more on space law of EU Member States, see Israel, *supra* note 25, at 16-25.

[29] FAST20XX, ESA, available at http://www.esa.int/Enabling_Support/Space_Engineering_Technology/FAST20XX_Future_High-Altitude_High-Speed_Transport_20XX, (last visited 2.9.2020).

[30] Masson-Zwaan T., et al., *The Future Regulation of Suborbital Flight in Europe*, Space Policy, 2014, http://dx.doi.org/10.1016/j.spacepol.2014.03.004, at 1.

[31] This concept is envisaged in the medium term of five to ten years. See FAST20XX, *supra* note 29.

[32] Ibid.

[33] Suborbital Aeroplanes (SoA) are rocket-powered winged aeroplanes.

Working Group (SoWG) which is working on the application of a lighter approach to suborbital flights, mirroring the US solution. Therefore, the idea of EASA's competence to apply all its rules on commercial suborbital flights has been put on hold.[34] The only limit to the definition of SoA is the specific kind of technology used for ascent. This approach excludes unwinged, pure rockets, and thus all suborbital ventures using the concept of a vertical launch.[35] Henceforth, these kinds of flights will be difficult to define and discern one from another. With the progress in technology, the line could become even more blurred.

To understand this better, we need to consider the technical side of the story. Namely, suborbital flights may be executed through a few different technologies. Nowadays, it is possible to use an aircraft launch or rocket propelled launch for the operation of suborbital flights. Each of them has its own particularities, primarily because they take place in different environments.[36] Another complication in defining suborbital flights comes from the fact that both parts of the flight – ascent and descent – could be executed in two possible ways. As Sameh explains, ascent in suborbital vehicles involves two major types of horizontal (or ballistic) aerospace vehicles, or a vertical take-off (rocket propulsion). Similarly, there are two possibilities for descent: return of the vehicle to the location from where it started, or return of the vehicle to a different location on Earth (also known as point-to-point suborbital transportation).[37]

Until now, there have been no suborbital flights which would fall under the scope of existing international law. However, as technological achievements progress, the situation might soon change. For example, during flights operated from certain, relatively smaller European countries, flight paths may traverse the airspace of neighbouring states, and incidents or accidents may happen across national borders.[38] This would lead to the application of international law, but the question remains as to *which* international law – would it mean the application of air or space law convention(s)? As Masson-Zwaan notes, the situation will change again once flights go further up, or when they ultimately develop into suborbital point-to-point flights. The choice of regime will have to be made: air law, space law, or a new *sui generis* regime.[39]

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[34] Masson-Zwaan, *supra* note 30, at. 2.
[35] Moro-Aguilar, R., *National Regulation of Private Suborbital Flights: A Fresh View*, FIU Law Review, vol. 10, no. 2, 2015, at 693.
[36] Aircraft launch means that the vehicle will be carried by an aircraft until it reaches a certain altitude and then, after its release from the aircraft, the spacecraft ignites rocket engines in order to continue its suborbital flight. Suborbital flight can then be completed by the return of the spaceship to its departure point or to another location. The rocket-propelled launch is a single-stage-to-orbit rocket launch with a detachable capsule. This capsule is released at a certain altitude, which then enables the experience of microgravity, following the capsule's return to Earth. See Hobe, S., et al., *Space Tourism Activities - Emerging Challenges to Air and Space Law*, Journal of Space Law, vol. 33, no. 2, 2007, at 360.
[37] Sameh, S. M. M., *Suborbital Flights: Environmental Concerns and Regulatory Initiatives*, Journal of Air Law and Commerce, vol. 81, no. 1, 2016, at 67.
[38] See Masson-Zwaan, T., Moro-Aguilar, R., *Regulating Private Human Suborbital Flight at the International and European level: Tendencies and Suggestions*, Acta Astronautica 92, 2013, at 245.
[39] Ibid.

Another potential problem regarding this issue is the delimitation of the air and space area. At the present time, there is no official delimitation between these spaces in international law. Taking into account all the circumstances noted, this paper will analyse both space law and air law treaties in the sections below, and examine the issue of suborbital flights from the perspective of both these regulatory regimes.

3. 2. Space law regulation

The question of where space begins and airspace ends is both legal and technical. From the legal point of view, the need for such separation could be crucial[40] because it might enable us to distinguish which set of rules to apply to suborbital flights. Air and space law legal regimes are governed by entirely different principles and therefore create two legal worlds; thus, issues arise where these two worlds overlap.

3. 2. 1. The spatialist and functionalist approaches

What appears to have been agreed upon among commentators is that the area below the altitude of 80 km above sea level belongs to airspace, whilst that above 110 km belongs to outer space.[41] However, this demarcation has not been approved in any international treaty, nor by the Legal Subcommittee of UNCOPUOS where it has been under discussion among its member states since 1959. But alongside this, even more ambiguous is the question of the area *between* these two altitudes, and the related question of its legal regulation (and activities taking place therein).

There are two different approaches, i.e. theories, to offering a solution: the "functionalist" approach, which concentrates on the criterion of the nature or purpose of a given activity, and the "spatialist" approach, which divides the applicable regime along the lines of a strict altitude boundary.[42] Many agree that the limit of space should be at the level of the *Kármán line* (where aerodynamic lift under the influence of centrifugal force ceases), as suggested by spatialists.[43] In contrast, the functionalists' approach regards a fixed altitude boundary to be irrelevant to the issue, and is based merely on the purpose of the vehicle

[40] The question of the need for a legal delineation between airspace and outer space first appeared after Sputnik I. Interesting to note is the approach taken by Martin Menter (US Air Force, former President of US Members of the International Institute of Space Law) who believed that this is not so necessary considering that the 1967 Outer Space Treaty took the functional approach. See Martin Menter, *Relationship of Air and Space Law*, 19 Proceedings on the Law of Outer Space, vol. 19 (1976), at 8.
[41] Hobe, *supra* note 36, at 362.
[42] Ibid.
[43] For more, see ibid., at 363.

or activity in question, basically asking "[w]hether the vehicle was classified as an aircraft or a spacecraft".[44] This is the reasoning behind the conclusion offered by ICAO.[45]

The United Nations Office for Outer Space Affairs (UNOOSA) Legal Subcommittee has formed a Working Group to answer these questions. This Working Group considers various matters related to the definition and delimitation of outer space.[46] We are hopeful that, in the light of new, looming technology, the long overdue answer to this question will be provided soon .

The responses to the delimitation issue again differ depending on the theory applied. From a spatialist viewpoint, there is no clear indication in international law on the delimitation of airspace and outer space that would permit a conclusion on the applicability of either air law or space law. However, if the argument is made from a functionalist viewpoint, the application of air law would prevail since airspace would be the main centre of activities of suborbital vehicles in the course of earth-to-earth transportation (any crossing of outer space being brief and only incidental to the flight). The Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is considering the question of possible legal issues with regard to aerospace objects but no final conclusion has yet been reached.[47]

In regulating commercial suborbital flights, the US has opted for the use of space law. Moreover, with the application of the previously mentioned CSLAA of 2004, all commercial space launch activities conducted in the US or by US nationals are monitored by the Federal Aviation Authority's Office for Commercial Space Transportation, with the accent placed on suborbital spacecraft and human flights.[48]

Personally, we would lean towards suggesting the use of the functionalist approach here. In this regard, we propose that future regulation be more inclined towards the purpose of commercial suborbital flights.

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[44] Balleste, R., *Worlds Apart: The Legal Challenges of Suborbital Flights in Outer Space*, New York University Journal of International Law and Politics, vol. 49, no. 4, 2017, at 1045; See also for other proposed demarcation theories.

[45] See more infra in ICAO Working paper, *supra* note 3 (ICAO Council, Concept of Suborbital flights, Working paper, C-WP/12436, 30/05/2005 p. 6, par. 5.2.

[46] For this purpose, the Working Group considers, among other things, information on national legislation and practice relating to the definition and delimitation of outer space, and reviews responses of States and international organizations to questionnaires on issues relating to the definition and delimitation of outer space, as well as on issues relating to suborbital flights for scientific missions and/or for human spaceflight. See UNOOSA, Working Group on the Definition and Delimitation of Outer Space of the Legal Subcommittee, https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/ddos/index.html (last visited 5.6.2020).

[47] ICAO, *supra* note 3, at 8 (par. 6.2).

[48] Also see Langston, *Suborbital Flights: A Comparative Analysis of National and International Law*, *supra* note 24.

3. 2. 2. A space object

For a functionalist approach it would be useful to have a definition of a space object – since it seeks an answer to the question of applicable law based on the type of vehicle (and activity) that is being considered; however, this definition unfortunately does not exist in the space treaties. The first one to mention is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)[49] adopted by the UN General Assembly in 1966. The Outer Space Treaty provides the basic framework on international space law; however, it does not provide either a definition of a space object nor of a space activity. The same is true with the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue Agreement),[50] the Convention on International Liability for Damage Caused by Space Objects (Liability Convention)[51] and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement).[52] Alone among space treaties in defining a space object is the Convention on Registration of Objects Launched into Outer Space (Registration Convention).[53] Article II, in providing rules for the regulation of space objects, states: "When a space object is launched into earth orbit or beyond…",[54] giving us, indirectly, criteria for defining a space object: in relation to its reach. From this provision, we can conclude that the launched object becomes a "space object" when it is (launched) into the Earth's orbit, or beyond. As specified in Article I (c), a space object "includes component parts of a space object as well as its launch vehicle and parts thereof". This, however, makes the provision dubious, since thereby suborbital vehicles are excluded from the definition (their purpose is not to enter Earth's orbit). Therefore, suborbital vehicles ought not to be registered under the Registration Treaty.[55] Masson-Zwaan supports this approach using the case of SpaceShipOne, which the US Government did not include in its national registry of space objects; consequently, it did not provide the UN Register with the corresponding information about its flights. Although suborbital flights do not need to be registered formally under the Registration Treaty, this does not automatically imply that other space treaties will not be applicable to them as well, within their scope of

[49] Outer Space Treaty, General Assembly, resolution 2222 (XXI), opened for signature on 27 January 1967, entered into force on 10 October 1967, available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited 28.2.2021).
[50] Rescue Agreement, General Assembly, resolution 2345 (XXII), opened for signature on 22 April 1968, entered into force on 3 December 1968, available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited 28.1.2021).
[51] Liability Convention, General Assembly, resolution 2777 (XXVI), opened for signature on 29 March 1972, entered into force on 1 September 1972, available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited 8.2.2021).
[52] Moon Agreement, General Assembly, resolution 34/68, opened for signature on 18 December 1979, entered into force on 11 July 1984, available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited 8.2.2021).
[53] Registration Convention, General Assembly, resolution 3235 (XXIX), opened for signature on 14 January 1975, entered into force on 15 September 1976, available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited 8.2.2021).
[54] Ibid.
[55] The same approach is taken by Masson-Zwaan and Moro-Aguilar, see *supra* note 38, at 246.

application. But first we have to see if including them in the sphere of space law is justified, and, subsequently, if those treaties allow for this kind of interpretation under their provisions.

3. 2. 3. Non-existence of a commercial space regulation treaty

According to Takeuchi, space law could be applicable for that part of a suborbital flight that does not come under the jurisdiction of air law. However, he recognizes the problem of the lack of a clear definition of "space object" in the UN space treaties, for which reason the official interpretation will be decided by each State party, with no common understanding.[56]

Starting with the Outer Space Treaty, we find its application to suborbital flights possible. As repeatedly stated by many authors, public international law does not expressly determine commercial suborbital flights as a space activity. This is because, as previously discussed, suborbital flights are not defined by international law. Neither are space activities themselves properly defined, but, nonetheless, it is possible to construe that the Outer Space Treaty could govern the activity which would fall under the scope of commercial suborbital flights. The Outer Space Treaty addresses reaching "outer space" as a geographical point of action and not as "orbiting", which is precisely required for commercial suborbital flights. Reaching orbit is also not a prerequisite for establishing international responsibility and liability for space activities. Therefore, suborbital flights could fall under Articles VI and VII of the Outer Space Treaty. These articles govern authorization and supervision by the responsible State and the international liability of the launching State.[57] As we can see, the sole basis for this type of applicability is State oriented, and further development under this law would be to regulate suborbital flights with national law provisions in order to stay away from State responsibility if they were to be subjected to space law.

If proper international regulation for suborbital flights were to happen under space law, in the current framework, presumably the responsible body would be UNCOPUOS. This idea is supported by many authors, highlighting the possibilities which UNCOPUOS enjoys through its legal and technical subcommittees to promote the requirements of the international community and technical conditions set forth by the industry.[58] However, so far UNCOPUOS has not shown willingness to address commercial suborbital flights. UNCOPUOS has, as mentioned above, reviewed the ICAO Working Paper and has taken no further steps. However, some claim that it could be possible for UNCOPUOS to formulate a convention to establish ground rules for "space tourism" and other suborbital activities.[59] Although the industry of "space tourism" is still nascent, both technology and

[56] Takeuchi, Yu, *Regulatory Regime for Tomorrow's Suborbital Space Flights: Point-to-Point International Flights*, Proceedings of the International Institute of Space Law, 57, 2014, at 492.
[57] See Masson-Zwaan; Moro-Aguilar, *supra* note 38, at 245.
[58] See Cf. ibid., at 248.
[59] Masson Zwaan and Moro-Aguilar, see *supra* note 38.

regulatory work at State levels are happening fast, which might possibly also push the global regulator (UNCOPUOS and/or other suitable international organizations) in this direction in the near future.

3. 3. Air law regulation

Following the explanation of different theories regarding the potentially applicable law (legal regime), in this section we will look at the issue from the perspective of air law regulation.

3. 3. 1. Drawing a line between an aircraft and a spacecraft

Suborbital flights are executed through both air and space areas. Suborbital vehicles, used for the operation of suborbital flights, are designed in a particular way, having characteristics that resemble those of both aircraft and spacecraft.[60] Their designs reveal the intention that they perform equally well in airspace and outer space. For example, *SpaceShipOne* and *SpaceShipTwo* both have elements of a spacecraft, allowing them not to be supported by the reactions of air in the ballistic portion of the flight.[61]

Again, as noted above, the functionalist approach – which looks for an applicable regime based on the type of vehicle in question – would require the definition of aircraft to be stated unequivocally. The most obvious place to look would be the Convention on International Civil Aviation (Chicago Convention),[62] which is the constitution of international public air law.[63] In Annex 7 to the Chicago Convention, aircraft are defined as "all machines which can derive support in the atmosphere from the reactions of the air".[64] This definition has also been adopted in some national air legislations, such as the

[60] According to the position taken by the Committee on the Peaceful Uses of Outer Space of the International Association for the Advancement of Space Safety, spacecraft "should be capable of moving in outer space (either orbital or suborbital) without any support from the air, and should have a power source not dependent upon external oxygen". See *Suborbital Flights and the Delimitation of Air Space vis-à-vis Outer Space: Functionalism, Spatialism and State Sovereignty*, A Submission by the Space Safety Law & Regulation Committee of the International Association for the Advancement of Space Safety, prepared by Paul Stephen Dempsey and Maria Manoli, Vienna, 9-20 April 2018, at 16, available at https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_105c_22018crp/aac_105c_22018crp_9_0_html/AC105_C2_2018_CRP09E.pdf (last visited 28.2.2021).

[61] This is done due to the sparsity of air in the upper atmosphere, which hinders aerodynamic flight. See Hobe, *supra* at 35.

[62] Convention on International Civil Aviation, signed 7 December 1944, entered into force 4 April 1947, available at: https://www.icao.int/publications/Documents/7300_cons.pdf (last visited on 8.06.2020).

[63] This was coined by Professor Havel, B.F. and Gabriel Sanchez, in their monograph *The Principles and Practice of International Aviation Law*, New York, 2014.

[64] Also found in Annexes 2, 6 and 8. Moreover, Annex 7 of the Chicago Convention also includes "gliders, balloons, helicopters, ornithopters, rotorcraft, and gyroplanes" within the definition of aircraft.

German, Austrian or Croatian ones,[65] as well as under the EU (EASA) rules on "Air Operations – OPS".[66]

It is interesting that German legislation considers spacecraft, missiles and similar projectiles to be aircraft as long as they are in airspace, even though they are rocket propelled.[67] Also, as found in the 2014 Review Report that preceded the British Space Industry Act 2018, spaceplanes equate to aircraft, an approach that can easily be found in many provisions of the Space Industry Act. However, in certain other jurisdictions, rockets are explicitly "not classifiable as aircraft".[68] But cases where they are considered aircraft offer a valid argument for applying air law as the governing set of rules for suborbital flight, or at least the airborne part of it. Additionally, according to Hobe and Goh, a suborbital vehicle has all the characteristics of an aircraft, although it combines elements of the carrier aircraft and its attached spacecraft.[69] But when detached from the carrier aircraft, the suborbital vehicle – now a spacecraft – can no longer derive support in the atmosphere from the reactions of air, which is why it should be considered as a space object, and space law should be applied to it accordingly.[70]

It should also be taken into consideration that suborbital flights will have an impact on airspace operations, which is why air operation regulation will have to take them into

[65] The Croatian air transport law – Zakon o zračnom prometu (NN 69/09, 84/11, 54/13, 127/13, 92/14) states "*zrakoplov*: svaka naprava koja se održava u atmosferi zbog reakcije zraka, osim reakcije zraka u odnosu na zemljinu površinu"; the German Air Traffic Code, Luftverkehrsgesetz (Luft VG) states: "(1) Die Benutzung des Luftraums durch Luftfahrzeuge ist frei, soweit sie nicht durch dieses Gesetz, durch die zu seiner Durchführung erlassenen Rechtsvorschriften, durch im Inland anwendbares internationales Recht, durch Rechtsakte der Europäischen Union und die zu deren Durchführung erlassenen Rechtsvorschriften beschränkt wird. (2) Luftfahrzeuge sind 1. Flugzeuge, 2. Drehflügler, 3. Luftschiffe, 4. Segelflugzeuge, 5. Motorsegler, 6. Frei- und Fesselballone, 7. (weggefallen), 8. Rettungsfallschirme, 9. Flugmodelle, 10. Luftsportgeräte, 11. sonstige für die Benutzung des Luftraums bestimmte Geräte, sofern sie in Höhen von mehr als dreißig Metern über Grund oder Wasser betrieben werden können.Raumfahrzeuge, Raketen und ähnliche Flugkörper gelten als Luftfahrzeuge, solange sie sich im Luftraum befinden. Ebenfalls als Luftfahrzeuge gelten unbemannte Fluggeräte einschließlich ihrer Kontrollstation, die nicht zu Zwecken des Sports oder der Freizeitgestaltung betrieben werden (unbemannte Luftfahrtsysteme)"; Austrian Aviation Statute, Bundesgesetz vom 2. Dezember 1957 über die Luftfahrt, StF: BGBl. Nr. 253/1957, Luftfahrtgesetz (LFG), BGBl. I S. 840 states: "(1) Luftfahrzeuge sind Fahrzeuge, die sich zur Fortbewegung von Personen oder Sachen in der Luft ohne mechanische Verbindung mit der Erde eignen, gleichgültig, ob sie schwerer als Luft (zum Beispiel Flugzeuge, Segelflugzeuge, Hänge- oder Paragleiter, Schwingenflugzeuge, Hubschrauber, Tragschrauber und Fallschirme) oder leichter als Luft (zum Beispiel Luftschiffe und Freiballone) sind. Für Flugmodelle und unbemannte Luftfahrzeuge sind die Begriffsbestimmungen gemäß den §§ 24c, 24f und 24g anzuwenden... (3) Als im Fluge befindlich gilt: a) ein Luftfahrzeug schwerer als Luft von dem Zeitpunkt an, in dem Kraft für die eigentliche Abflugsbewegung verwendet wird, bis zur Beendigung der eigentlichen Landungsbewegung, b) ein Luftfahrzeug leichter als Luft vom Zeitpunkt der Loslösung von der Erdoberfläche bis zur Beendigung des neuerlichen Festmachens auf ihr".

[66] Under Annex I - Definitions for terms used in Annexes ii-viii, in relation to Commission Regulation 965/2012 "Aircraft" means a machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

[67] Furthermore, under Canadian law (Aeronautics Act, 1985), aircraft is defined as "any machine capable of deriving support in the atmosphere from reactions of the air, and includes a rocket". See Dempsey and Manolli, *supra* note 60, at 35.

[68] E.g. Sweden and Finland. See Israel, *supra* note 25, at 22.

[69] Hobe, *supra* note 36, at 364.

[70] Ibid.

account and be adjusted accordingly. This adjustment might also include (partial) regulation of suborbital flights. Following this line, EASA has noted that the ATM system will need to be addressed in both the current airspace management and HA.[71] Adjustments will also have to be made at some airports, which will require the installation of dedicated, protected areas used for the fuelling of suborbital aircraft (rockets).[72]

3. 3. 2. ICAO and SARPs as a regulatory solution

If we follow this approach and line of interpretation, we can further suggest ICAO as a relevant and competent international institution, and SARPs[73] (or another, new regulatory framework) as the law governing a certain proportion of suborbital flights. The ICAO Secretariat is in favour of this approach. It takes the position that vehicles used for suborbital flights fit the Chicago Convention's definition of aircraft and that they will fly in airspace at least during their ascent and descent phases.[74]

Moreover, if we are conscious of the purpose of suborbital vehicles, which in their commercial use is either the transport of passengers from one point to another, or space tourism, we could claim that ICAO would have jurisdiction over these arrangements if they were to include an international element (international transport). According to Article 44 of the Chicago Convention, "[t]he aims and objectives of the Organization are to develop the principles and techniques of international air navigation to foster the planning and development of international air transport so as to: a) Insure the safe and orderly growth of international civil aviation throughout the world…" and, among other things, "Meet the needs of the peoples of the world for safe, regular, efficient and economical air transport".

Considering that each State has sovereignty over its airspace, and suborbital flights traverse airspace (to say the least), they should be internationally regulated in order to perform international suborbital flights. By taking this approach we could ensure a global, universal legal regime for suborbital air services. Supporting these views, Moro-Aguilar mentions how the Chicago Convention does not place restrictions on the authority of ICAO to encompass with its regulation aircraft which only traverse the upper reaches of Earth's atmosphere.[75] Furthermore, the drafters of the Chicago Convention acknowledged that new perspectives of international civil aviation, which they could not have foreseen at the time, would certainly emerge. This is clear from Article 44 of the Chicago Convention, which regulates the competences of ICAO, as well as Article 37, which provides for a legal framework covered by SARPs.[76] This kind of interpretation was used on many occasions

[71] See EPAS 2021-2025, *supra* note 10, at 42.
[72] Ibid.
[73] SARPs are adopted by the ICAO as envisaged in Article 37 of the Chicago Convention in order to standardize safety requirements, in coordination with State Parties and service providers.
[74] See Takeuchi, *supra* note 56, at 491-492.
[75] Moro-Aguilar, *supra* note 35, at 683.
[76] This view is shared by other authors as well, e.g. Dempsey and Manoli, *supra* note 60, at 35.

when other air law areas were emerging,[77] and it presents another reason for the presence of ICAO while addressing the problems regarding the regulation of commercial suborbital flights.

The regulation of commercial suborbital flights could be done through SARPs, which could be more suitable for the regulation of these types of flights because their creation and implementation process is faster and easier than, for example, possible amendments to the Chicago Convention.[78] Since not many States worldwide are, or are expected to be, involved in launching commercial suborbital flights in the near future, it is not realistic to change a historical air law instrument such as the Chicago Convention, or to expect huge interest in their international regulation overall. In this sense, SARPs appear a more suitable solution. Following the technical requirements of SARPs, States can choose to opt for a higher level of regulation, which will not jeopardize minimal unification and safety for all involved in commercial suborbital flights.

Returning to reasons in favour of implementing provisions regarding suborbital flights into international air law rules and regulations, air traffic control and air traffic management should be mentioned.[79] As already explained, for the greater part of their trajectory, suborbital flights travel through airspace. Clearly, among suborbital vehicles there is an abundance of aircraft in airspace every day. In order to maintain the safety of air transport and manage both types of flights when they are in the same space, the most practical and safe solution would be to place suborbital vehicles under the same rules as ATM.[80]

However, some possible negative impacts of exclusive air law regulation have also to be taken into account. Moro-Aguilar stresses this issue, pointing to the fact that the air law regime, which has evolved over several decades as the aviation industry has matured, may be too demanding for the nascent industry of suborbital flights.[81] For operators of suborbital flights, it would mean having to comply with numerous rules of air law which may negatively impact the new industry and create financial and other barriers that would challenge their further growth.

As mentioned above, the EU so far has not expressed any formal decision on commercial suborbital flight regulation. Moreover, the European Commission initially even refused,

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[77] Such as recent issues of environmental protection (greenhouse gas emissions), or cybersecurity issues.

[78] Dempsey and Manoli suggest promulgating a new Annexe 20 to the Chicago Convention – "Space Standards". See *supra* note 60, at 35.

[79] Menter observed the issue of traffic control of space craft in the light of the delineation of air and space area, as follows: "For traffic control purposes any 'incoming' craft from outer space will have contacted Air Traffic Control and its Terminal Controller before it reaches the demarcation line". See Menter, supra note 40, at 170.

[80] Same Dasqupta, U., *Legal Issues on Sub-Orbital Space Tourism: International and National Law Perspectives*, Annals of Air and Space Law, 38, 2013, pp. 237-281, at 250. See, also, Israel, explaining why ATM should take the lead over three identified phases of suborbital flights (the ascending phase, the suborbital phase, and the returning phase), *supra* note 25, at 64-65.

[81] Moro-Aguilar, *supra* note 35, at 684.

after being asked, to provide EASA with a mandate to formulate provisions regulating this area,[82] giving this explanation: *"…*the recent entry into force of the Treaty on the Functioning on the European Union (TFEU) has codified the competence of the EU in the field of space activities. Although the EU had been working in close cooperation with ESA since approximately ten years, there was no formal legal basis to do so until now. Looking at the specific articles that are relevant to determine the extent of this 'new' EU competence, it is rather questionable whether the EU could undertake specific action to regulate space tourism, that is, by enacting EU regulations in this field or by harmonizing national laws".[83] This problem hinges on the question of whether commercial suborbital flight is considered to be aviation or space activity.[84] Depending on how EU Member States might define winged suborbital vehicles – as aircraft or spacecraft – this could, in the case of the former, entail the application of the EU air transport *acquis*, as Member States have transferred their legislative powers in the area of air law to the EU.[85] Use of the existing Aviation Rulemaking, Certification, and Standardization processes under the existing aerospace regulations to SOA is being considered.[86] There are also certain provisions within ESA that imply that commercial suborbital flights are to be considered aviation. However, after these documents, ESA engaged in the previously mentioned FAST20XX project.[87]

On the other hand, EASA could, if appointed by the Commission, become the main regulator for commercial suborbital flights in Europe. The objectives of EASA, as set forth in the Basic Regulation,[88] could also apply to commercial suborbital flights – among other things, especially to: "(i) promote research and innovation, inter alia, in regulatory, certification and oversight processes".[89] As stated in the Regulation itself, "[e]ventually, EASA could be given a larger role with regard to safety and licensing issues of suborbital vehicles operating in Europe, possibly through an amendment to the Basic Regulation (EC) 216/2008 in order to include suborbital flight in the mandate of the Agency. Alternatively, a separate Space Transportation Agency could be created in the European Union",[90] which could be used as a platform for the creation of a new *sui generis* regime in Europe. In the words of Masson-Zwaan, "[t]he tasks of this new agency or EASA department would be to grant authorization of private space flights (suborbital and

[82] See *supra* note 6 and accompanying text.
[83] Masson-Zwaan, T., *Regulation of Sub-orbital Space Tourism in Europe: A Role for EU/EASA*, Air and Space Law, vol. 35, no. 3, 2010, pp. 263-272, at 267.
[84] For more about the competences of the EU regarding space, see ibid., at 267-269.
[85] See also Masson-Zwaan, *supra* note 30, at 2; and AMMELOOT; MARCIACQ, *supra* note 19, pointing to eight different solutions for the regulatory approach that EASA has submitted to the European Commission.
[86] Ammeloot; Marciacq, *supra* note 19.
[87] See *supra* note 29.
[88] Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91, OJ L 212, 22.8.2018, p. 1–122.
[89] Ibid.
[90] Ibid., at 3.

orbital) departing from European soil; harmonize safety standards for all private spaceflights carrying passengers; and serve as the EU point of contact for all topics of relevance concerning the regulation of these activities".[91] This would comply with the prediction of economists, industry leaders and legal scholars who consistently claim that, in order to flourish, a new industry should not be overly regulated.

4. SOLVING THE JURISDICTIONAL PROBLEM BETWEEN AIR LAW AND SPACE LAW

One among several jurisdiction problems regarding suborbital flights is the question of the law that should govern their regulation. As we have seen throughout the analysis given, there are two different approaches to solving the issue. According to one (the spatialist approach), when the "aerospace object" is in airspace, aviation law should govern it; and when in outer space, space law should govern it. This approach focuses on the physical location of the "aerospace object".[92] Conversely, the other (the functionalist approach) suggests that the object's purpose and the nature of its activity should be the key factors in determining the applicable legal regime.

Masson-Zwaan has set the discussed problem as a simple question and has offered a plausible method of resolving it, without the need to consider delimitation between airspace and outer space. According to her, the issue should be resolved by the functionalist approach, and hence air law would be applied if suborbital space tourism were regarded as aviation, and space law applied if it were treated as a space activity. [93] But how can it be determined to which type of activity these flights belong? And does it mean that different types of suborbital flights could (and should) be treated differently? The latter is exactly the approach which Israel chose when determining applicable law. He identified three different type of suborbital activities to which different regimes may apply: first, intercontinental point-to-point transportation, which, according to him, should be ruled by international aviation law; second, suborbital space missions, which do not demand that an alternative legal regime be envisaged and should be ruled by space law; and thirdly, space tourism, which lies between the other two categories.[94] This last, however, does demand a special legal regime to combine elements of both air and (outer) space law, and leaves us again with the issue unresolved.[95] Therefore, although this approach appears to be an overarching one that takes the functionalist approach a step further, it might not be the best, especially bearing in mind the change of technology and

[91] Masson-Zwaan, *supra* note 30.
[92] See Walker, M., *Suborbital Space Tourism Flights: An Overview of Some Regulatory Issues at the Interface of Air and Space Law*, Journal of Space Law, vol. 33, no. 2, 2007, at 391.
[93] See Masson-Zwaan, *supra* note 83, at 264.
[94] Israel, *supra* note 25, at 83.
[95] Israel suggests that "[i]f a sui generis legal regime were to be envisaged, elements of aviation – including national and outer space law - might very well be taken into account as insightful components". Ibid.

probable emergence of new types (characteristics) of suborbital flights that could – in the case of applying this approach – require yet another *sui generis* regime.

5. CONCLUSION

Commercial suborbital flights are in the process of development – both technological and regulatory. As can be concluded from the issues addressed in this paper, commercial suborbital flights are floating in the outer space of legal provisions. There are numerous issues to be resolved by public international law – first and foremost, a proper definition of suborbital flight, which is currently non-existent. This is one enormous obstacle preventing a decision on which regime could govern commercial suborbital flights. Another immensely relevant issue is the impossibility of ascertaining which legal regime – air or space – should be addressed primarily, which is principally due to the absence of an internationally acknowledged delimitation between airspace and outer space. These two issues are intertwined because parts of suborbital flights could be regulated by both air and space law. Furthermore, manifestations of these elements are not present equally in all suborbital flights, depending on the technology at hand, its usage and purpose, and also on whether aerodynamic lift or rocket-powered technology is used. Putting this technology to use might be problematic considering the non-existent provisions in space law regarding commercial transportation. Private companies which are executing suborbital flights have no responsibilities under international space law. A completely different regime is provided under the scope of international air law – this regime regulates every aspect of each commercial flight.

To conclude, we strongly support the argument for commercial suborbital flights to become properly regulated. The simple measure of finally establishing delimitation between air and space areas would make a difference and might at least direct us towards solving the jurisdictional problem. However, this would not preclude discussions on the purpose of these flights, which is not at all in question: the transport of people and goods. Following this line would lead us to the conclusion that it would be more suitable to regulate commercial suborbital flights under existing international air law.

Commercial suborbital flights present a challenge for international law. There are constant discussions among scholars proposing that commercial suborbital flights could come under air or space law, or perhaps certain portions of flights might be conducted under different regimes. What is undeniable at the present moment is that space law is ill-equipped to deal with commercial space transport, as there is no adequate international body focusing on the commercial aspects of space. Conversely, international air law governing commercial air transport is fully developed, regulating all aspects, including market access, standardization and liability.[96] What might appear the best

[96] Haslinger B., Stadlmeier S., *Public International Law - Text, Cases and Materials*, Linz, 2017, at 138.

solution currently is to establish a *sui generis* regime just for commercial suborbital flights. This regulation should be governed by the ICAO, bearing in mind how commercial development is foreign to the current international space law regime, where UNCOPUOS should be a supervisory body. UNCOPUOS is needed, nevertheless, to give its opinion regarding the commercial use of space if suborbital flights were to be considered as partly a space activity. The proposed regime would not entail all current ICAO regulation, but it should rather contain as little as possible, focusing on the special provisions granting safety, security, licensing, mandatory insurance and liability. All this should be done bearing in mind the possible unrestrained development of suborbital technology. Therefore, a possible convention regarding commercial suborbital flights is eagerly awaited.

Whatever approach the international community takes, it had better be sooner than later, and it should be thought through carefully, in order to create a suitable environment for the development of this new mode of transportation.

KOMERCIJALNI SUBORBITALNI LETOVI: ZRAČNO ILI SVEMIRSKO PRAVO?

Koncept komercijalnih suborbitalnih letova nije moguće jasno definirati dok nam nedostaju dvije temeljne stvari: definicija suborbitalnog leta i zakonska regulativa za tu vrstu letova. U pokušaju da razlučimo zračni i svemirski zakonski režim, koji bi potencijalno mogli urediti komercijalne suborbitalne letove, zbog nepostojećeg razgraničenja između zračnog i svemirskog prostora suočavamo se s nekoliko pitanja, na koja je potrebno pronaći odgovore. Ta pitanja moguće je razmotriti kroz dva različita pristupa – prostorni (engl. *spatial*) i funkcionalni (engl. *functional*), na temelju kojih je moguće utvrditi potpadaju li komercijalni suborbitalni letovi u područje zračnog ili svemirskog prava.

U tom kontekstu u ovom radu želimo sagledati širu sliku analizirajući postojeće zakonodavstvo i rad regulatornih tijela u EU-u i SAD-u. Zaključno, temeljem provedenog istraživanja i analize, u radu predlažemo novi, *sui generis* pristup za uređenje komercijalnih suborbitalnih letova, koji bi mogao biti realiziran u okviru zasebne konvencije, donesene od strane ICAO-a u suradnji s UNCOPUOS-om. Ona bi komercijalne suborbitalne letove tretirala kao posebnu kategoriju letova.

Keywords: komercijalni suborbitalni letovi, međunarodno zračno pravo, međunarodno svemirsko pravo, svemirski turizam, razgraničenje zračnog prostora

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