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Space as a Competition Domain: Threats and Opportunities

Dmitry V. Stefanovich, IMEMO RAS, Moscow, Russia
Daniel Porras, Secure World Foundation, Washington DC, the USA

Correspondence: stefanovich@imemo.ru

ABSTRACT

The article deals with the unfolding race for military, technological, and political influence in space. Great powers have competed in space since the dawn of the Space Age. Today we are once again faced with the possibility of space warfighting, but there are more than two players in the game now and civil infrastructure depends on space more than ever before. Theoretical space war threats are often analysed through an assessment of possible targets. And there are real-life challenges and threats here, including but not limited to rendezvous and proximity operations (RPO), existing destructive anti-satellite (ASAT) capabilities, non-destructive electronic warfare, and cyber and jamming capabilities. The greatest threat, though, comes from simple misperceptions of actions in space by different actors. Space cannot be separated from dynamics on Earth, but there might be some room for space-specific confidence-building, risk reduction and even arms control measures.

KEYWORDS

space, military space, anti-satellite capabilities, space defence, counterspace capabilities, weapons in space, international norms

Introduction

Great powers have competed in space since the dawn of the Space Age. Original space launch vehicles were the close brethren of long-range ballistic missiles, and the advantages of satellite-based reconnaissance and communications were understood early on, not to mention the political symbolism of a space race. Military applications for space developments was a priority. However, great powers agreed early on to put some limits in place as since, for all practical purposes, space is a global commons. Still, the 21st century has demonstrated that these limits can be questioned and discussed. This paper aims to list the current challenges and offer a set of possible solutions can prevent further deterioration of space relations in space, which might lead to actual warfighting in space and on Earth.

The space environment is changing rapidly, little resembling the scene as it was when space arms controls were first adopted – effectively, now we see a new scene in space. The most dramatic change today is the rapid increase in the number of spacefaring and space-using actors (nations and commercial enterprises) with the number of space assets growing from 1,500 to nearly 5,000 in just a few short years.[1] Under such circumstances, any conflict in space (which, of course, is an extension of a "terrestrial" conflict) can have a very real impact on "bystanders" due to the nature of this global commons.

This topic is not new. A great deal of research has been carried out on this very issue, and a number of articles have been published, including over the last decade. In Russia, the topic has been explored by such scholars as A. Arbatov, V. Dvorkin, P. Topychkanov, S. Oznobishchev, and V. Mizin, whose work was published in an edited volume by the Carnegie Endowment for International Peace in 2010.[2] Even at that time, an argument was made that there is no alternative but to find cooperative solutions for the challenges of possible hostilities in the outer space.

A. Arbatov also argued in a 2019 paper for the establishment of several interconnected treaties addressing different threats.[3] The "fragmentation" of the space domain and the establishment of separate architectures (with a focus on possible defensive missions) had been acknowledged in papers by L. Saalman (with a focus on China and Russia),[4] and K. Pollpeter, and E. Barrett (with a focus on NATO as an alliance).[5]

In 2005, American Academy of Arts and Sciences published "a reference manual" on physics of space security, written by D. Wright, L. Grego, and L. Gronlund, which remains one of the best sources for technical reference[6].

J.C. Moltz was among the first scholars to emphasize the ongoing change in the architecture of space competition related to rapid growth in commercial activities.[7] L. Pankova studied the risks posed by growing competition in space in great detail.[8]

1 Union of Concerned Scientists Satellite Database, accessed June 14, 2022, ucsusa.org/resources/satellite-database.
2 Arbatov, Dvorkin 2018.
3 Arbatov 2019.
4 Saalman 2022.
5 Barrett, Pollpeter 2021.
6 Wright et al. 2005.
7 Moltz 2019.
8 Pankova 2021.

H. Grest addressed the possible impact of "New Space" for military operations, noting the poor coordination in increasing activities in space and the advantages that can be provided by commercial solutions to military missions.[1]

Finally, there is a rather direct link between space domain and issues of strategic arms control and nuclear deterrence. Historical dynamics in that field, with anti-satellite capabilities threatening mutual verification of compliance with arms control agreements between the U.S. and USSR had been studied based on archival material by A. Bateman.[2] Issues of space-based nuclear command, control and communications systems and their vulnerabilities and, thus, escalation threats are addressed by James Acton, who specifically raises a question of prohibiting interference with such assets.[3] S. Egeli offered several options as "fixes and remedies" to some of the challenges of space-based military and dual-use activities, including increased resilience, improved space situational awareness and assorted regulations, including behaviour-based arms control[4].

The issue of "war in space" is being analysed both from a military[5] and an international relations perspective. As such, it can lead to rather different conclusions, which, most importantly, differ in terms of whether space is an "ultimate high ground,"[6] or whether security dynamics in this domain are merely a continuation of terrestrial events.[7]

Theoretical Threat

Weapons have already been deployed in space – during the previous Cold War. The same is true for counterspace capabilities. However, even now there are claims that some of the assets deployed by Russia (inspector satellites labelled as "space torpedoes"[8]) and the United States (the X-37B orbital test vehicle[9]) can be described as weapons. Such claims are made with regards to some capabilities of Chinese satellites, including Shijian-17 with a robotic arm[10], while other 'robotic arms' do not raise such concerns. Nevertheless, so far, as it seems, we are still not on a brink of actual warfighting in space. Apart from temporary electronic interference (which may or may not amount to an attack), no country has ever "attacked" another's space object.

At least 11 countries possess counterspace capabilities in different forms today.[11] These can be separated into two major baskets: destructive and non-destructive. Theoretically, all of these can be used in conflict, and while destructive anti-satellite capabilities (both direct-ascent and co-orbital) are likely to trigger a major escalation,

1 Grest 2020.
2 Bateman 2022.
3 Acton 2018.
4 Egeli 2021.
5 Boucher 2022.
6 Lambeth 2003.
7 Bowen 2020.
8 Chelsea Gohd, "Everyone Wants a Space Force – But Why?" Space.Com, accessed June 14, 2022, https://www.space.com/every-country-wants-space-force.html
9 *Козин, В.* Холодная звездная война // ВПК. 29 ноября 2021. [Электронный ресурс]. URL: https://vpk-news.ru/articles/64859 (дата обращения: 14.06.2022).
10 Ken Moriyasu, "China Can 'Grapple' US Satellites With Robotic Arm, Commander Says," Nikkei Asia, April 21, 2021, accessed June 14, 2022, https://asia.nikkei.com/Politics/International-relations/US-China-tensions/China-can-grapple-US-satellites-with-robotic-arm-commander-says.
11 "Global Counterspace Capabilities Report 2022," Secure World Foundation, accessed June 14, 2022, https://swfound.org/counter-space/.

non-destructive options have been used without crossing the line of actual military conflict.

The former includes cyber and electronic warfare tools that can be used to hit communication links and command centres, temporarily or even permanently cutting the data exchange with the satellite. Such threats are considered very real, including by the highest Russian and U.S. Government officials.[1]

Somewhere in between are directed energy weapons, e.g. lasers, which are currently available. At present, the development of an operationally sensible laser weapon capable of destroying targets in orbit still appears impracticable. However, it is quite possible to dazzle the optical-electronic sensors of enemy reconnaissance satellites, which is reportedly already one of the primary missions of the Russian Peresvet battle laser.[2] Likewise, the U.S. Space Force is also searching for ways to use directed-energy systems to "be an effective capability for space dominance."[3]

Here, the clash of interests becomes inevitable, as Russia's priority is to prevent anyone from gaining superiority in the space domain, as it is perceived as a threat to Russian nuclear deterrence forces, which, in turn, serve as an ultimate safeguard of the existence of the Russian state.[4] Likewise, the U.S. considers its space-capabilities to be vital to national security and, ultimately, to its overall military capabilities.[5]

In Russia, the concept of joint Air-Space defence covers air defence, missile defence, space forces (including space situational awareness, or Space Control System), early warning systems, and the Moscow ABM system.[6] Moreover, as a recent article in the respected Military Thought journal published by the Ministry of Defence of the Russian Federation notes, this architecture possibly includes the Space Countermeasures System.[7]

If, at the same time, the United States and its allies consider any effort to undermine their perceived superiority as a major threat that should be addressed and minimized, then this seems to be a direct pathway to conflict involving attacks against space assets.

When considering the different directions that an arms race in space might take, the worst possible situation is the deployment of weapons capable of striking targets on Earth's surface from space. So far, it seems unlikely that any major country would make a decision to go that way, in large part because such projects are yet prohibitively expensive[8]. While all "building blocks" are currently unavailable, it is not unimaginable

1 Видеообращение Михаила Мишустина к участникам международного онлайн-тренинга по кибербезопасности Cyber Polygon // Правительство России. [Электронный ресурс]. URL: http://government.ru/news/42723/ (дата обращения: 14.06.2022); "General John Raymond, Chief of US Space Force, Noted That China Is Developing 'Everything From Reversible Jammers of our GPS System to Jamming of Satellite Communications,' Ryo Nakamura," Nikkei Asia, September 9, 2021, accessed June 14, 2022, https://asia.nikkei.com/Editor-s-Picks/Interview/US-Space-Force-chief-convinced-China-would-use-satellite-killers.

2 "Borisov: Laser System 'Peresvet' Can Blind Satellites at an Altitude of up to 1,500 km," TASS, May 18, 2022, accessed June 14, 2022, https://n.tass.ru/armiya-i-opk/14655039.

3 Nathan Strout, "The Space Force wants to use directed-energy for space superiority," C4ISRNET, 16 June 2021, accessed June 14, 2022, https://www.c4isrnet.com/battlefield-tech/space/2021/06/16/the-space-force-wants-to-use-directed-energy-weapons-for-space-superiority/.

4 *Стефанович, Д.* Космос как предчувствие // Россия в глобальной политике. 1 сентября 2020. [Электронный ресурс]. URL: https://globalaffairs.ru/articles/kosmos-kak-predchuvstvie/ (дата обращения: 14.06.2022).

5 "Annual Threat Assessment of the US Intelligence Community," Officer of the Director of National Intelligence, February 2022, accessed June 14, 2022, https://www.dni.gov/files/ODNI/documents/assessments/ATA-2022-Unclassified-Report.pdf.

6 Воздушно-космическая оборона // Министерство обороны РФ. [Электронный ресурс]. URL: https://encyclopedia.mil.ru/encyclopedia/dictionary/details.htm?id=4486@morfDictionary (дата обращения: 14.06.2022).

7 Кумакшев, Кравцов 2021.

8 Laura Grego, "Space-based Missile Defense," Union of Concerned Scientists, August 2018, accessed June 14, 2022, https://www.ucsusa.org/resources/space-based-missile-defense-0.

that future developments in space technology could make such capabilities a reality. Strike missions for spacecraft, against terrestrial and space objects, including in missile defense missions (so-called "left-of-launch" concept, which is, basically, a re-branded counterforce posture), could one day be available. Importantly, whether or not such space-to-Earth weapons are possible, the idea of them is an important concern for many countries around the world[1]. This is not only limited to Russia and China, but is a view held by many emerging space actors. As such, discussions at the UN level are often divided between countries who wish to address threats to space systems, and countries concerned with threats from space systems.

One important factor supporting this rather bellicose attitude of certain countries developing counterspace capabilities is the current debate surrounding the development of self-defence capabilities for spacecraft to protect them against the enemy's counterspace capabilities.[2] The problem is that the very same capabilities can also be used to threaten enemy spacecraft, and this is a classic case of a "security dilemma," which often contributes to a very real arms race.

No matter how theoretical all the listed threats are at the moment, one can see a clear trend towards realising some form of conflict in space. Indeed, even law firms are beginning to dive into the challenge of the weaponization of space,[3] a sure sign that they see a rising demand for their services.

Current Cases

As of today, space objects play an important role as enablers and force multipliers for terrestrial, Earth-based military capabilities. Currently, their main purpose is intelligence, surveillance and reconnaissance (ISR), and targeting, with a possible dramatic increase in such capabilities in the near future.[4]

Other existing missions for space-based capabilities are early warning, navigation and communications, including in the nuclear domain, with most of those being used on a daily basis. Moreover, early warning and space situational awareness missions are interconnected, and often employ the same assets. At the moment, there are only land-based radars, but space-based ones will likely soon be deployed.

Anti-satellite (ASAT) weapons are a reality, but they are not that different from missile defence systems. Thus, in order to properly address ASAT capabilities, we need to address the missile defence issue first, which is an extremely challenging task in itself. As an example, in 2008, the U.S. was able to use an AEGIS SM-3 missile interceptor to destroy a satellite.[5]

Moreover, given that airborne early warning and control (and intelligence, surveillance, and target acquisition) aircraft are considered a priority target for air

1 Porras 2019.
2 Theresa Hitchens, "Space Lasers for Satellite Defense Top New French Space Strategy," Breaking Defense, July 26, 2019, accessed June 14, 2022, https://breakingdefense.com/2019/07/france-envisions-on-orbit-lasers-for-satellite-defense/.
3 "Webinar: Weapons in Space," Volterra Fietta, January 19, 2022, accessed June 14, 2022, https://www.volterrafietta.com/upcoming-webinar-weapons-in-space/.
4 Sandra Erwin, "Space Force Looking to Deploy Radar Satellites to Track Moving Targets on the Ground," Space News, May 12, 2021, accessed June 14, 2022, https://spacenews.com/space-force-looking-to-deploy-radar-satellites-to-track-moving-targets-on-the-ground/.
5 "Global Counterspace Capabilities Report 2022," Secure World Foundation, April 2022, accessed June 14, 2022, https://swfound.org/counterspace/.

defence, military satellites can also become a target for "space defence" in the event of a full-scale military conflict.

Military and intelligence rendezvous proximity operations (RPOs) present another important challenge. While RPOs are not a threat by default and can actually be quite useful in ensuring resilience and longer operations of satellite constellations there is, as with many other capabilities, room for malign actions. Servicing satellites or destroying them, gathering operational data or interfering with their onboard equipment are relatively similar tasks, and it is impossible to deduce the actual mission of a given payload delivered to orbit given the lack of transparency. Detailed fact sheets on actual RPOs performed by China[1], Russia[2], the United States[3], and commercial actors are available,[4] and such activities are relatively "observable" even by amateurs. There are no immediate solutions, but the threat – or perceived threat – is continuously growing. The major issue with RPOs is that they are often brought to attention of the general public in order to achieve political gains. The end result is that it is becoming politically expedient to malign a type of technology that could be immensely useful in ensuring the long-term sustainability of space activities.[5] Ironically, all the major space powers are developing such technology.

A huge challenge is the fact that, even within the military space domain, there are some dual-mission capabilities and assets, such as:

– early warning/military communications
– ASAT/ABM
– ISR satellite/targeting satellite
– inspector satellite/space torpedo
– radar/communications/electronic countermeasures
– light space launch vehicles for swift replenishment of satellite constellations constellations/light launcher for the swift deployment of co-orbital ASAT
– capabilities for the "precision" deployment of assets to space, (existing and future spaceplanes and space tugs)/space-to-surface strike systems.

This further complicates any efforts to limit or control actual military capabilities.

Introducing a ban on the destructive testing of counterspace capabilities, as well as on all sorts of attacks against critical space-based infrastructure, especially infrastructure that is connected to nuclear command, control and communications, could serve as a very important contribution to international peace and security, and to strategic stability between nuclear superpowers. However, as we mentioned earlier, it is hard to achieve something of such a scale immediately, and it should not be an end in itself. These measures could be especially effective if they are accompanied by some data-sharing agreement, which could enhance trust among space rivals.

1 "Chinese Military and Intelligence Rendezvous and Proximity Operations," Secure World Foundation, accessed June 14, 2022, https://swfound.org/media/207367/swf-chinese-militarintel-rpo-may-2022.pdf.
2 "Russian Military and Intelligence Rendezvous and Proximity Operations," Secure World Foundation, accessed June 14, 2022, https://swfound.org/media/207366/swf-russia-militaryintel-rpo-may-2022.pdf.
3 "U.S. Military and Intelligence Rendezvous and Proximity Operations," Secure World Foundation, accessed June 14, 2022, https://swfound.org/media/207365/swf-us-militaryintel-rpo-may-2022.pdf.
4 "Commercial and Civil Rendezvous and Proximity Operations," Secure World Foundation, accessed June 14, 2022, https://swfound.org/media/207375/swf-commercialcivil-rpo-may-2022.pdf.
5 Mike Wall, " 'Truly Chilling': US Satellites Vulnerable to Enemy Attack, Ted Cruz Says," Space.com, May 17, 2017, accessed June 14, 2022, https://www.space.com/36880-united-states-satellites-vulnerable-enemy-attack.html.

It is important that we first gain an understanding of how the threats that prompt the development of these capabilities and possible attack scenarios are perceived. But, so far, most of the relevant actors prefer to engage in megaphone diplomacy and play a never-ending blame game, which is further augmented by the ongoing crises in European and global security.

Finally, space competition cannot and should not be separated from the dynamics on Earth, but there still might be some room for space-specific confidence-building, risk reduction and arms control measures. As space capabilities play a key role in any major military operation, it is difficult to "prevent an arms race in outer space" without preventing it in every other domain. However, the physical realities of space, such as orbital dynamics, makes it possible to reach agreements over areas where there is a convergence of interest.

Nevertheless, currently we see a trend towards growing hostilities in space, and ambitious efforts to change these dynamics are needed.

Options and Solutions

Most countries need their own satellites for ISR and targeting, especially given the introduction of next generation long-range precision weapons.

Thus, there might be some room for cooperation in terms of defining limits and red-lines for space-based ISR capabilities – both in their employment patterns and in the threats to these capabilities. Moreover, given the demise of the Treaty on Open Skies, some sort of a joint transparency regime based on shared satellite data could be an option.[1]

As noted earlier, technology designed to degrade or even destroy enemy space objects is constantly being developed and tested, just like the development we see in other military domains. These capabilities can be put into two baskets: destructive and non-destructive, which means that space objects are either destroyed by kinetic impacts, or their sensors and communication capabilities are degraded through interference by electromagnetic, cyber or directed energy means.

This does not mean that such dynamics are in any way positive or "normal," or that they will eventually lead to an arms race or a military conflict. However, simply acknowledging the issue is not enough to prevent such negative scenarios.

First, efforts should be focused on understanding the threat perceptions of different actors involved in developing counter-space capabilities. These efforts should be carried out in good faith, to try to understand the foundations of such perceptions, rather than simply labelling threats as "non-existent" or even an excuse for developing one's own capabilities. The "perceived" threat of space-to-Earth weapon is only one example where mutual respect among rivals could further diplomacy.

Second, as long as counter-space capabilities exist and are being developed and refined, it should be a priority to develop additional confidence-building mechanisms. One way to address this is to establish a notification regime similar to the one used for Earth-based tests of long-range weapons (NOTAMs and NOTMARs – notices to airmen

1 Stefanovich 2021.

and mariners). Of course, establishing hazardous areas, or sectors, or "volumes", where testing can take place in outer space, or in orbit, is far more difficult. However, it is certainly worth discussing such issues, and useful and usable solutions may appear. These results might become even more important should humankind finally move to other celestial bodies.

Third, states should be more transparent about the purpose of destructive and non-destructive tests involving space objects. It is an established fact that anti-satellite and ballistic missile defence capabilities are very similar. Of course, the international community may not be particularly concerned about the details of a relevant mission or the design behind a given "experiment." However, if we address the challenge of an arms race in outer space, it is crucial for states to be transparent about their intentions. Not because it serves some sort of a "greater good" for all humankind, but simply because their national security will be enhanced in a more effective way. Otherwise there will definitely be an overreaction by their peer competitors, which, in turn, will demand countermeasures.

The ever-increasing number of satellites operated by different actors occupying different orbits and demonstrating different behaviour effectively leads to the need for space traffic management (STM). STM is an umbrella term for several concepts, including space traffic coordination (where objects should go) and space-object monitoring (where objects are), as well as the implementation of regulatory regimes (keeping objects where they should be). To prevent the further deterioration of space security due to increasing RPO capabilities and cases, one option could be to develop so-called safety-zones around satellites and possibly other spacecraft, where other satellites would be prohibited from "entering." And, of course, as with other cases, there is a huge demand for increased transparency on the part of RPO-capable actors.

Another important question is: What is the best platform to discuss all these options? There are some universal bodies under the UN, but there are also a number of consortiums and coalitions that do not include all relevant actors. Perhaps the best course of action for the foreseeable future would be to use all tracks, although there is always the risk that they could lose touch with other. A possible downside of discussions in individual formats is the lack of standardized terminology, i.e. people will discuss the same phenomena using different words, or use the same words, but mean different things. This might become a very serious hurdle, thus, a development of some sort of universally accepted glossary of space security terms can be a very timely initiative. Credit where credit is due, NATO already made a small step in this direction, adding a "NATO space terminology" section to the "NATO's overarching Space Policy" document.[1] Joint NATO-Russia glossaries on different topics[2], as well as the P5 Glossary of Key Nuclear Terms[3] suggest that while imperfect, working mechanisms are possible on this track.

1 "NATO's Overarching Space Policy," NATO, January 17, 2022, accessed June 14, 2022, https://www.nato.int/cps/en/natohq/official_texts_190862.htm.
2 "Documents & Glossaries," NATO-Russia Council, accessed June 14, 2022, https://www.nato.int/nrc-website/en/documents-glossaries/index.html.
3 "P5 Glossary of Key Nuclear Terms: Working Paper, submitted by China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America, NPT/CONF.2020/WP.51," UN Digital Library, accessed June, 2022, https://digitallibrary.un.org/record/3956428.

Finally, a somewhat natural solution would be to enhance international cooperation in space: space – and we should never tire of stressing this point – is a perfect example of a global commons. It is used for the good of all humankind and, as such, the benefits of cooperation should outweigh the benefits of securitizing this domain and focusing on the military and defence dimensions. Cooperation does not exclude competition, but its prioritization can lead to better mutual understanding, de-escalation, and, eventually, the establishment of proper legal regimes aimed at avoiding actual warfighting in space.[1] One of the key takeaways from the Outer Space Security Conference hosted by UNIDIR in Autumn 2021 was that: "Cooperation between different actors can be beneficial for all parties and can optimize space governance measures, thereby contributing to keeping space peaceful and secure."[2]

There is no lack of creative options that can contribute to de-escalation in space. Still, all of those require sufficient political will.

Conclusion

As the very same great powers that are competing are also dependent on space infrastructure (despite the efforts to establish alternative enablers), some sort of agreement that this infrastructure will not be targeted, at least by destructive attacks and during conflicts that do not involve direct fighting between those powers, might be possible.

The best (and the most challenging) option would be to establish a legally binding regime (although this still would not be perfect as technology is constantly evolving). Alternatively, the "softest" approach adopted by Russia of signing joint statements on "No First Placement of Weapons in Outer Space," even with countries that do not have anything to place in space, could be useful and seen as a kind of "norm-setting." Likewise, the newly announced US commitment not to conduct kinetic ASAT tests is also a similar norm.[3]

Still, it is impossible to imagine an actor who can voluntarily agree to limit the capabilities of space launch vehicles, put a cap on the power of radar and communications satellites, or cancel all RPOs. However, such actions should be limited through established norms and, eventually, by legally binding instruments.

The crucial step would be to agree on which real actions should be prohibited. So, the idea is to address not the "hardware," but the principles of how these capabilities are actually used.

One way to look at the challenge is to discuss the "redlines." The disadvantages of such an approach are obvious; however, there might be some use for an agreed list of actions that are considered a precondition for an actual military response (the destruction of a space asset, for example), and another list of actions that should lead to formal consultations on what has taken place (temporary jamming or dazzling), etc.,

1 Pankova et al. 2021.
2 María Garzón Maceda, Eleanor Krabill, and Almudena Azcárate Ortega, "2021 Outer Space Security Conference Report," UNIDIR, Geneva, accessed June 14, 2022, https://doi.org/10.37559/WMD/21/Space/02.
3 "Remarks by Vice President Harris on the Ongoing Work to Establish Norms in Space," The White House, April 18, 2022, accessed June 14, 2022, https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/04/18/remarks-by-vice-president-harris-on-the-ongoing-work-to-establish-norms-in-space/.

and, of course, a "final list," which is considered a pathway to nuclear use (i.e. damaging of early warning or nuclear command control and communications capabilities).

The large-scale deployment of actual strike capabilities in space (both for space-to-space and space-to-surface missions) is the gravest of concerns. The discussion on what actually constitutes a space-based weapon could go on forever, but in this case one way to look at the issue would again be based on behaviour. Not everything can be simulated, and not every system in outer space should be considered a weapon unless, and until, it is actually tested as such. There are serious doubts that military officials will be ready to use any capability (with obviously huge consequences both for its success and failure) unless it has been properly tested.

Eventually, we might achieve a fragile balance that contains a little bit of everything – some norms, some weapons, and some laws. Of course, given where we are in 2022, it is next to impossible to imagine full scale cooperation between the major actors. However, we can expect at least some coordination, as the alternative is far worse.

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Authors

Dmitry V. Stefanovich,
Research Fellow, Center for International Security, Primakov National Research Institute of World Economy and International Relations, Russian Academy of Sciences, 117997, Moscow, ul. Profsoyuznaya, 23.
e-mail: stefanovich@imemo.ru
ORCID: 0000-0002-8694-8040

Daniel Porras,
Director of Strategic Partnerships and Communications, Secure World Foundation, 1779 Massachusetts Ave. NW, Washington, DC, 20036, the USA.
e-mail: dporras@swfound.org

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Космос как пространство соперничества: угрозы и возможности

АННОТАЦИЯ

В статье поднимаются проблемы возможного соперничества и сотрудничества между крупными державами в космическом пространстве. Великие державы соперничали в космосе с самого начала космической эры. Сегодня вновь актуальна проблема боевых действий в космосе, но теперь игроков больше, чем две державы, и сегодня наблюдается гораздо большая зависимость гражданской инфраструктуры от космических технологий. Теоретические угрозы космической войны в статье будут проанализированы путем оценки возможных целей, вызовов и угроз великих держав в потенциальной космической войне. В статье рассматриваются потенциальное значение операций стыковки и сближения (*RPO*), соотношение сил противоспутникового оружия (*ASAT*), а также в сфере радиоэлектронной борьбы в сфере киберпространства. Авторы приходят к выводу, что наибольшая угроза исходит от искаженного восприятия действий в космосе контрагентами. Космическую сферу невозможно отделить от политических процессов, происходящих на Земле. Авторы также рассматривают потенциал возможностей мер по укреплению доверия, снижению рисков и даже контролю над вооружениями в сфере космической деятельности.

КЛЮЧЕВЫЕ СЛОВА

космос, противоспутниковое оружие, космическая оборона, противокосмические потенциалы

Сведения об авторах

Стефанович Дмитрий Викторович,
научный сотрудник Центра международной безопасности, Национальный исследовательский институт мировой экономики и международных отношений им. Е.М. Примакова РАН (ИМЭМО РАН), Москва, Россия, ул. Профсоюзная, 23. 117997.
e-mail: stefanovich@imemo.ru
ORCID: 0000-0002-8694-8040

Дэниел Поррас,
Директор по стратегическим партнерствам и коммуникациям, Secure World Foundation, 1779 Massachusetts Ave. NW, Вашингтон, округ Колумбия, 20036, США.
e-mail: dporras@swfound.org

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