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H.E. Mr. Volkan Bozkır
President, United Nations General Assembly

2 September 2021

Dear Mr. Bozkır,

Re: Kinetic ASAT Test Ban Treaty

The undersigned urge the United Nations General Assembly to take up consideration of a kinetic anti-satellite (ASAT) test ban treaty. The need for such a treaty is driven by very rapid growth in the number of satellites in orbit.

International cooperation on maintaining safe access to Earth orbit dates to 1963 when the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water prohibited the testing of nuclear weapons in space because of concerns about radiation, including the threat posed to satellites.

The number of active and defunct satellites in orbit has grown from 3300 to over 7600 in the last decade, with the potential addition of as many as 100,000 active satellites within the next ten years. This rapid growth is raising concerns about collisions and the proliferation of space debris, endangering all forms of space use, from crewed missions, to communications, to Earth observations and environmental monitoring, to space-based astronomy. New practices are needed for the safe and sustainable use of space.

A major step toward this end would be a kinetic ASAT test ban treaty. Kinetic ASAT weapons, whether ground-based or space-based, employ high velocity physical strikes through the use of a 'kill vehicle' or shrapnel to destroy or disable objects in orbit. Due to the high impact energies involved, debris from a kinetic ASAT test often ends up on highly eccentric orbits that cross multiple satellite 'orbital shells' twice per revolution. If just one piece of debris from such a test collides with a satellite and causes a major fragmentation event, this could lead to additional events affecting all States, which could include further fragmentations, satellite failures, or service disruptions.

A kinetic ASAT test ban treaty would prohibit the use of any high velocity physical strikes during testing. 'Fly by' tests would still be permitted.

Even low-altitude kinetic ASAT tests that seek to minimize long-lived debris are problematic because the high impact energies are still able to place some of the debris on eccentric orbits that can extend more than 1000 km above the test altitude. The following figure demonstrates how a low-altitude test would have the potential to affect a busy, near-future orbital environment that includes at least four planned 'mega-constellations' from different countries: SpaceX's Starlink with 42,000 satellites and Amazon's Kuiper with 3236 satellites, both from the United States; OneWeb with 7000 satellites from the United Kingdom; and Guo Wang's StarNet with 12,992 satellites from China.

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The figure depicts the orbital altitudes of these four mega-constellations as well as a real-world example of debris produced by a kinetic ASAT test conducted at an altitude of 280 km — the 2019 Indian ASAT test.

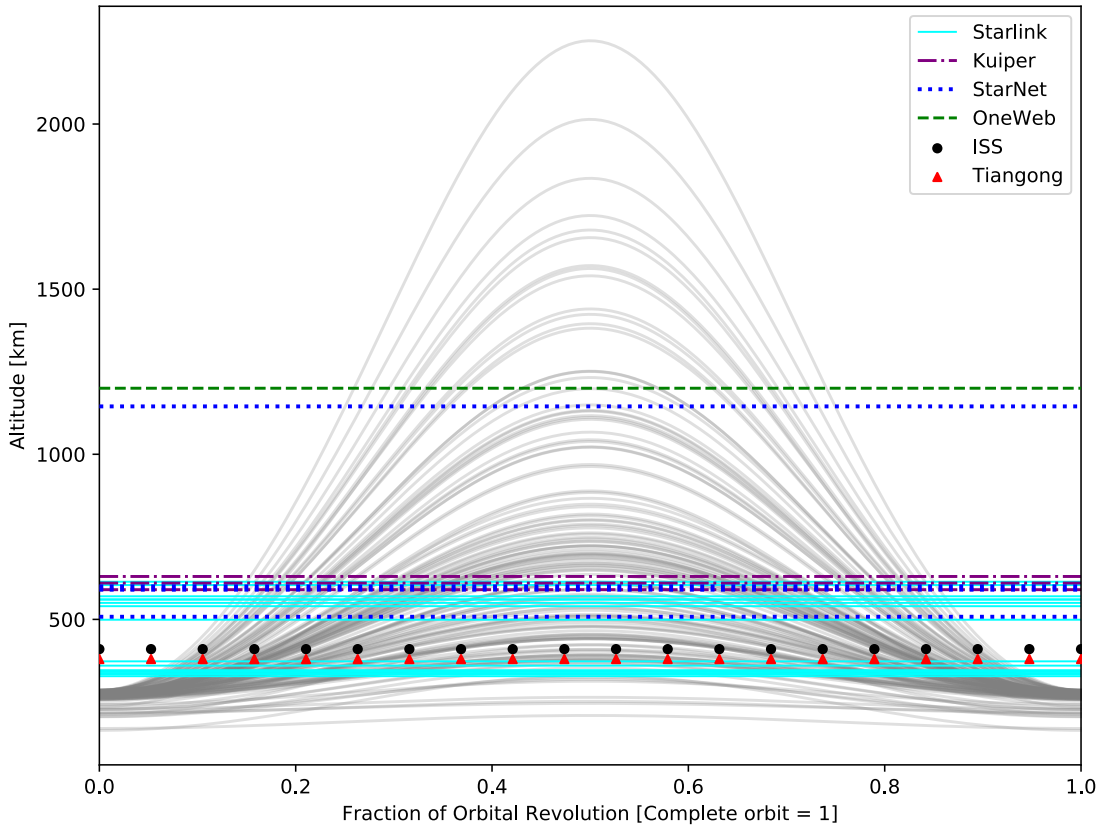

Figure: Consequences of a low-altitude kinetic ASAT test in a mega-constellation environment. The grey curves show the orbital paths of catalogued debris that resulted from the 2019 Indian ASAT test. Each path represents a given debris piece's orbit when first catalogued, many of which were only characterized well after the event. The curves thus already show evolution due to atmospheric drag. Fragments that re-entered the atmosphere too quickly to be characterized are not shown on this plot. For illustration purposes, the orbital paths are shown in phase and follow a fragment's altitude over one 360-degree orbital revolution. Also shown are the nominal altitudes for Starlink (cyan), StarNet (blue), Kuiper (purple), and OneWeb (green). Each line represents one of the orbital regions for the given mega-constellation (an 'orbital shell'). The approximate altitudes of the International Space Station and China's Tiangong space station are shown using the solid black circles and red triangles, respectively. It is important to remember that the debris as depicted was created despite a good faith effort to avoid creating space debris. It is also important to recognize that only trackable debris is depicted. A much larger amount of un-trackable (i.e., smaller) debris is likely also present. Data: USSPACECOM and FCC/ITU Filings.

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We note that a number of States have conducted debris-generating ASAT tests. The figure shows the Indian test for two reasons: (1) it is a very recent test event; and (2) it involved a good faith effort to avoid creating debris, including through the deliberate choice of a low altitude.

As the figure makes clear, debris from this 2019 test did cross the orbit of the International Space Station and would have crossed the orbits of both the planned satellite mega-constellations and China's new Tiangong space station, creating multiple operational hazards. The development of mega-constellations along with the expected growth of crewed space missions make debris-generating ASAT tests significantly more perilous than before.

While the existing debris field is already a major operational concern for satellites, debris-generating ASAT tests have contributed – and would contribute – to sudden and consequential changes in the overall debris environment.

Efforts to negotiate constraints on kinetic ASAT weapons have been underway since 1979 when the United States and the Soviet Union came to a preliminary agreement to ban the testing and use of such weapons. Although that initiative lapsed, we see two reasons for making renewed efforts today. First, as demonstrated above, a kinetic ASAT test ban treaty is needed now more than ever before. Second, support for such a treaty is quickly building across the international community.

In 2018, United Nations Secretary-General António Guterres wrote: 'The United Nations remains uniquely placed to facilitate international cooperation and mutual restraint as the only sustainable solution to ensuring peace and security in outer space.'

Two years later, in 2020, the United Nations General Assembly adopted its Resolution 75/36 on 'Reducing space threats through norms, rules and principles of responsible behaviours', which:

> Encourages Member States to study existing and potential threats and security risks to space systems, including those arising from actions, activities or systems in outer space or on Earth, characterize actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security, and share their ideas on the further development and implementation of norms, rules and principles of responsible behaviours …

This resolution also asks the Secretary-General to 'seek the views of Member States' and 'submit a substantive report' to the General Assembly at its seventy-sixth session commencing in September 2021. The report is now available (UN Doc. A/76/77) with the responses submitted by States indicating strong support for restrictions on kinetic ASAT testing.

Russia has called for 'a complete and comprehensive ban on space-based strike weapons as well as on any land-, air-, or sea-based systems designed to destroy objects in outer space.' China expressed a similar view.

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Australia, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Norway, Slovenia, the United Kingdom, and the European Union expressed the view that kinetic ASAT tests should be avoided.

Ireland, New Zealand, and the United States identified kinetic ASAT tests as a category of behaviour 'that could be considered during further development and implementation of norms, rules, and principles of responsible behaviors.'

Brazil, Mexico, Sweden, and Switzerland expressed support for multilateral negotiations leading to legally-binding constraints on kinetic ASAT testing.

Most importantly, not a single State in its response submitted for this United Nations report has stated that kinetic ASAT testing is an appropriate or internationally legal action.

Clearly, momentum in favour of multilateral constraints on kinetic ASAT testing is growing among Member States of the United Nations. This is understandable given that the risks posed to the international community by such tests are increasing quickly, as demonstrated above.

For these reasons, the undersigned urge the United Nations General Assembly to take up consideration of a kinetic ASAT test ban treaty.

We would be grateful if you could distribute this letter to Member State delegations. We are thankful for your attention and support.

Yours sincerely,

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