

A satellite image of Earth showing a coastline and a satellite in orbit. The satellite is a small, white, cylindrical object with solar panels extended, positioned in the center of the image. The background is a brown, textured landscape, likely a desert or mountain range, with a blue body of water visible on the left side.

Space Crises in a Multipolar World: Lessons from a Simulation Exercise

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INTRODUCTION

After a relative lull for nearly three decades, outer space is once again becoming an area of geopolitical competition and potential conflict. The reasons for this are obvious. Once dominated by two or three powers, outer-space activities today involve more than 60 players, including commercial non-state actors. National-

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security driven applications of space, too, have gained greater traction in the past decade, particularly in the Asian context. The so-called “revolution in military affairs” (RMA) that began around the end of the Cold War in the late 1980s led to states putting a premium on network-centric warfare. Any RMA-influenced military today puts an emphasis on network centrality that, in turn, relies on significant space-based assets for “Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance” (C4ISR).

As a reaction to this, offensive kinetic weapons have been developed, which seek to disrupt C4ISR networks. Chief among special-purpose kinetic weapons that could gravely disrupt satellite-based military capabilities are anti-satellite (ASAT) missiles. Ten years ago, China’s test of an ASAT weapon—against one of its own satellites—was interpreted as a shift towards exploiting “the U.S.’s Achilles heel — Washington’s over-reliance on satellites for C4ISR.”¹ Meanwhile, non-kinetic methods of disrupting satellite communication continue to be enhanced. Cyber capabilities, for example, act as a force multiplier for counterspace operations. Since 2015, the Chinese People’s Liberation Army (PLA) has had a stated doctrinal objective of “winning informatized local warfare.”² Control and denial of space-based assets is expected to play a key role in the PLA strategy derived from this doctrine.

Terrestrial geopolitics, with the end of the “unipolar moment” and the (re)emergence of several powers, including revisionists such as Russia, continue to complicate strategic postures. Russia’s “Gerasimov Doctrine” envisions the use of all means available—conventional and social-media campaigns, and cyber and sub-conventional operations—to achieve geostrategic objectives.³ The 2007 cyber attack on Estonia as well as the 2014 invasion of Crimea, a part of Ukraine, are widely held examples of how Russia puts its hybrid warfare doctrine in practice. Domestic politics, the rise of populism, and a backlash against globalisation and relative economic decline have also emerged as key drivers of geopolitics, as evident in the 2016 election of Donald Trump to the US presidency.

To understand the interaction between contemporary terrestrial geopolitics and the intense, ongoing securitisation of the outer space, driven, in part, by the acquisition of offensive kinetic and non-kinetic weapons that can deny and disrupt space-based civilian and military assets, Observer Research Foundation (ORF) organised a half-day simulation exercise (SIMEX) in February 2017. The objective of the SIMEX was to play out a scenario in which, given the underlying geopolitical conflicts, states had already attempted to interfere with outer-space assets in an effort to deny certain military functions. The ORF SIMEX was structured on the lines of another such exercise organised by the Secure World Foundation and the Centre for Strategic and International Studies in November 2016, in which one of the authors of this report was a participant.⁴ It sought to examine five key questions: In a hybrid conflict that draws in multiple powers with

stakes in the outer space—military and civilian—how are national objectives in a conflict met? Can escalation in such conflicts be controlled? What do the decision-making dynamics within states face in such a crisis, and what role does intelligence play in it? What roles do multilateral institutions and side payments play in controlling escalation? Finally—and this question emerged only after the SIMEX was completed—what role does disinformation and information play in determining the tempo and outcome of such a conflict?

This report answers these questions based on the results of the ORF SIMEX. The next section of this report provides a brief background of the scenario played in the SIMEX. The third section presents an analysis of the results of the SIMEX, answering the questions raised above. The paper concludes in the fourth section, with a few brief policy-relevant observations. An appendix collates details about how each of the three moves of the SIMEX played out. Readers interested in other details of the SIMEX—standard operating procedure, briefing background, a map of the universe of the SIMEX, country and force capability inventory, details of the scenario, team objectives and options—may consult the companion page at <http://www.orfonline.org/wp-content/uploads/2018/01/WEBUPLOAD-SIMEX-V4.pdf>.

BACKGROUND AND SCENARIO

As noted above, the SIMEX involved one scenario that played over three moves. It had four teams and one control cell. The teams had players of different backgrounds and expertise, including strategy, and military- and civilian-space issues. While the teams represented four fictional states—Yellow, Orange, Blue and Red—the background briefing as well as the scenario was such that the players, attuned as they were to contemporary geopolitics, understood which country their “state” represented. The control cell’s predefined adjudication guidelines, too, kept this “translation” in mind.

Yellow was the United States under Donald Trump, indifferent to alliance commitments and prickly about the trade deficit that it runs with China, which was disguised as Orange. By design, Blue was Putin’s Russia. The scenario contemplated a Russian move against a smaller European NATO member, such as one of the Baltic states, represented by Red.⁵ The Russian *modus operandi* during the invasion of Crimea was taken into account while creating the SIMEX scenario. The force inventory given to the teams reflected (dis)parity in capabilities of the four states. Contemporary geopolitical trends were also interpolated to 2020.⁶ Thus, the scenario reflected an apparent Blue–Orange entente, a tense Yellow–Orange relationship and a Red unsure of the value of security guarantees from Yellow.

The scenario that formed the in-brief to the first move of the SIMEX involved three days in March 2020. On 20 March 2020, there is a disruption in the

broadcast of a live speech by the Red PM, which was to announce a set of internal security measures against pro-Blue activists in his country. Red and Yellow media publishes stories within six hours of the event suggesting that this was the work of an extremist pro-Blue group that managed to jam the direct-to-home signal. These stories, quoting unnamed senior Yellow intelligence officials, further suggest that the pro-Blue group enjoys state support from Blue leadership, and the disruption could not have been carried out without direct, albeit covert, support from its security agencies. Matters are also complicated because Orange owns and operates the Direct Broadcast Satellite (DBS) that was tampered with. Soon after the disrupted broadcast, about 15,000 pro-Blue activists take to the streets of Red capital. Red internal-security forces open fire on the crowd, killing 35 activists. Blue government strongly denounces this act in public. State-run media in Orange denounce this hacking but, crucially, omit any mention of Blue.

On 23 March 2020, as protests in the Red capital continue and riots break out all over the country, Blue government issues a series of statements suggesting that the Red government seeks to “annihilate” Blue minorities in Red, with Yellow’s support. In turn, the Red leadership argues that these statements are a precursor to a Blue invasion of Red, albeit one that will use irregulars without insignia. The Red prime minister calls the Yellow president for advice, while moving a few Red special-operations units to the Red–Blue border. Blue responds by placing a squadron of attack helicopters in forward positions and orders about 1,000 odd special operators to amass in makeshift camps along the Red–Blue border.

On 27 March 2020, Yellow receives confirmed intelligence that Blue will broadcast a speech addressed to Red minorities to rise against the Red government while, simultaneously, moving its forces into Red. Yellow realises that the Yellow–Red alliance treaty will then compel it to aid Red. To prevent a Yellow–Blue war, the Yellow president orders his military to shoot down an Orange satellite that Blue is likely to use for the broadcast urging the insurrection. A technical targeting malfunction causes the Yellow direct-ascent ASAT weapon to destroy an Orange military communications satellite instead. Yellow apologises to Orange, but Orange’s state-run media calls this an act of war.

ANALYSIS

Attainment of National Objectives

All teams were assigned national objectives to meet by the end of the SIMEX. These objectives were part of an eyes-only brief to each team and were, therefore, unknown to the others. Yellow achieved its national objective of preventing a Blue occupation of Red, albeit after it ensured that the risk of a Yellow–Orange confrontation was minimised. This is unsurprising, given that the background of the SIMEX posited a nativist Yellow leadership. Orange met its national objective of extracting a proportionate price for Yellow’s inadvertent targeting of its satellite

by a combination of non-kinetic military and economic means: it disabled Orange's missile warning satellite in Move 1 as a retaliation and secured monetary compensation for the same by leveraging a multilateral forum, the Permanent Court of Arbitration in Hague. However, beyond entering into a neutrality agreement with Red, Orange did not act directly to meet its second national objective: ensuring, without using force, that Blue did not invade Red.

Red's national objective was simple: to prevent Blue from occupying it. It did meet this objective through a combination of side payment and diplomatic outreach. A key move for Red was offering Orange advanced technology, and neutrality in the Orange–Yellow arbitration, through which it ensured that Blue was further isolated. The surprise, however, came from Blue, which was assigned the primary objective of establishing a Blue-backed government in Red. Despite being a major disruptive military power and showing considerable force throughout the SIMEX, it failed to meet this target. Blue was also tasked to use a potential Yellow–Orange confrontation to invade Red; such a confrontation did not take place.

Escalation Dynamics and Control

One of the key objectives behind the SIMEX was to test the possibility of escalation following a crisis in space. For this, Move 1 started relatively high on the escalation ladder: the destruction of Orange's military communications satellite by Yellow. Given this, there was a possibility of a shooting war right from the outset. A Yellow–Orange kinetic conflict was indeed possible, triggered by disproportionate retaliation on the part of Orange or its (mis)perception of Yellow's "intent" in the use of the ASAT weapon. This was not the case. Orange's decision to skip Move 2 and Move 3 was a sign that it wanted to keep the possibility of overt confrontation in check while engaging with all parties through private diplomatic channels. However, by the end of Move 3, there were serious signs of confrontation between Blue and Yellow, driven by the latter's decision to deploy a variety of military assets against the latter, including co-orbital ASAT weapons. Whether this was a result of the third move being the last one of the SIMEX—and therefore one where players could afford to be aggressive without consequence—is unknown.

In-team Decision-making

The control cell had embedded a rapporteur inside each team, who were also instructed to observe and record decision-making dynamics.⁷ The following observations stand out from this element of the SIMEX. Inside Blue, there was a difference of opinion about the possibility of a Yellow–Orange confrontation at the start of the SIMEX, in Move 1. While there was agreement on the need to cooperate with Orange economically, some considered military-to-military space cooperation a "bad idea," given the ongoing crisis. The thinking within Orange during Move 1

was that a raise in military alert status could contribute to de-escalation, an interesting assessment given that Orange's adversaries could interpret such a raise as a signal of escalation. The most interesting report of in-group "hawk/dove" decision-making dynamics came from the Yellow rapporteur in Move 2: The Yellow team was split on the issue of whether to unconditionally offer damage payment to Orange for the loss of their military communications satellite or not. While team members with a military background argued that compensation to Orange should be conditional upon Orange not contributing to further escalation, the civilian experts in the Yellow team argued for unconditional compensation.

Role of Strategic Intelligence

One of the features of the SIMEX was the presence of confidential information in form of "eyes-only" intelligence inputs given to each of the teams. These inputs were assigned probabilities in percentages, in line with the practice of the US intelligence community.⁸ To capture the fact that not every national intelligence agency has the same assessment of any given situation, the intelligence provided to the four teams were not always consistent and indeed often conflicting. The goal behind introducing this element in the SIMEX was to examine the extent to which strategic intelligence influences decision-making in politico-military crises.⁹

Red's actions through the three moves were consistent with the intelligence provided to them. While it raised its alert status in Move 1, it did not carry out offensive operations against Blue in that move; its intelligence had assessed a Blue invasion of Red using SOF to be in the "probable" range (65 percent certainty) though not "very likely" or "certainly." However, Red's intelligence assessment of Orange's neutrality in a Yellow-Blue conflict, assessed in the same range at 70 percent, likely contributed to their decision to aggressively pursue diplomatic and technology transfer options with Orange. Had the "neutrality" assessment been much lower, it is possible that Red would have pursued a different approach vis-à-vis that country.

Yellow's intelligence assessment that Orange leadership was split on the issue of retaliating in response to the ASAT used against their military communications satellite contributed to Yellow reaching out to Orange. Orange's decision to skip Move 2 tacitly verified this assessment. Its decision to rapidly escalate in Move 3 was in line with its intelligence assessment—in the "very likely" scale—that Red forces would be overrun in case of a Blue invasion. It is, however, possible that had Yellow intelligence indicated a near-certain retaliation by Orange as well as an Orange-Blue military past, it would have perhaps reneged on its alliance commitments to Red.

Orange's intelligence assessment—in the "likely" scale, at 60 percent—that Blue intelligence tampered with Red's DBS (through an Orange-owned satellite) was most likely the cause behind its decision to stop both Red and Blue transmissions through its satellites; it was also a means to contribute to de-

escalation. Other intelligence that may have contributed to Orange's decision to de-escalate any potential conflict with Yellow is its assessment in the "likely scale" that Blue would use a Yellow–Orange crisis to seize historically disputed territory from Orange.

From the point of view of the role of strategic intelligence in crisis decision-making, Blue's actions are the most interesting. Blue intelligence was highly unsure—at 20 percent probability—that Yellow intentionally targeted the Orange military communications satellite. Yet, according to one Blue team member, Blue's actions in Moves 2 and 3 banked on the potential Yellow–Orange conflict and encouraged it to provoke a conflict. It is likely that Blue chose to ignore the intelligence in favour of its perception of a mutual Yellow–Orange distrust.

Role of Multilateral Institutions and Side Payments

Another interesting fact that emerged during the course of the SIMEX was how—even in the face of serious escalation—multilateral dispute resolution mechanisms remain important. The SIMEX started in Move 1 with the news that an Orange military communications satellite was destroyed by a Yellow ASAT, albeit accidentally. While Orange did take modest military steps to signal its displeasure, such as dazzling a Yellow satellite, it accompanied them with a lawsuit against Yellow at the Permanent Court of Arbitration in The Hague, demanding monetary compensation for its loss. Given the backstory that was created for the SIMEX—a world in 2020 where the international order is fraying at its seams—this was a surprising move, especially when one takes into account that the decision to move to formal arbitration was taken by an actor that was roughly modelled after China, a country that, for ignoring the Hague Tribunal's 2016 ruling on the South China Sea, has been widely accused of not adhering to international law and institutions.

While Orange moved the Hague Tribunal, Red cleverly leveraged it to offer Orange neutrality along with technology transfer to secure Orange's neutrality in the Blue–Red dispute. This side payment led to a rift between Orange and Blue, thereby deterring Blue from escalation early on in the SIMEX. This instance of a side payment from an economically stronger but militarily weaker state to a counterpart of opposite attributes suggests that such payments may indeed have a role in dampening intense crises and alliance dynamics—approaches that remain underexplored in the international-relations theory literature.

Hybrid Nature of Warfare

According to the embedded team rapporteur, it was Orange's blocking of Blue (and Red) broadcasts using Orange-owned satellites, that motivated Blue's decision to move its propaganda campaign to social media and newspapers. However, the social-media campaign took a life of its own as the SIMEX progressed to the third

and final move, when Blue social-media activists trended messages supporting new elections in Red. At the same time, the Blue government issued calls for the same, accusing the Red government of supporting the ethnic cleansing of Blue minorities. This suggests a coordinated Blue campaign across media domains and supports the notion that in a future crisis, belligerents could leverage social media to affect certain outcomes. Indeed, Blue was modelled on Putin's Russia, an actor that has relied—in pursuit of a hybrid war doctrine since 2007—on large groups of state-sponsored social-media trolls to spread (dis)information that supports its foreign policy position.¹⁰

CONCLUSION

Four key lessons emerged from the SIMEX, all of which merit further study through other similar exercises.

First, a crisis that starts relatively high up in the escalation ladder can be de-escalated. The exercise started with the premise that Yellow had destroyed, albeit accidentally, an Orange military communication satellite using an ASAT weapon. Thus, there was a strong possibility of a kinetic conflict during and after the first move. However, this was not the case. Instead, Orange multilateralised the dispute by approaching the Permanent Court of Arbitration and took only modest military punitive steps against Yellow.

Second, possession of significant kinetic and non-kinetic military means does not always translate to meeting the national objectives of a state. Blue in the SIMEX served as an example. Despite significant military capabilities, it failed to meet both its national objectives. Lack of military heft, on the other hand, can be compensated for by using smart diplomatic tactics. This was the case with Red, which is the weakest military power of the four.

Third, in a significant crisis involving three or more powers, a state will prioritise meeting those objectives that concern it directly, as opposed to those related to its alliance commitments. That does not mean, however, that states will not meet their alliance commitments at all. Yellow's behaviour vis-à-vis Red is a case in point.

Fourth (and this pertains to the increasingly hybrid nature of warfare), in moments of intense crises, social and other media remain powerful tools. This is evident in how Blue moulded international and domestic opinion using social media in tandem with public statements containing the same message. 

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APPENDIX

REPORT OF MOVES

Move 1/In-Brief for Move 2

Following major damage and disruptions to Red's satellite network, it had acquired additional ISR capability from Yellow. Furthermore, SATCOM downlinks on the Blue–Red border had been disabled, the attack being attributed to Yellow in response to satellite disruptions in Red. Orange, too, had disabled one of Yellow's missile-warning satellites.

In the meantime, Red had raised alert status of its forces positioned against Blue. Red had deployed its air and ground forces along the border with Blue, in addition to implementing a no-fly zone against that country. Red had also successfully jammed Blue's commercial SATCOM downlinks. In public, Red denounced Blue's aggressive moves while calling for a bilateral discussion to resolve the conflict.

In line with its national objective of establishing a Blue-backed government in Red, Blue raised the alert status of forces against that country. This included deploying 135 tanks and 200 artillery forces in addition to putting its SOF bases along the Blue–Red border on higher alert.

Yellow responded to the evolving situation by raising the alert status of its forces in the region around Blue, which included three aircraft carriers, 20 frigates, 23 destroyers, 20 attack submarines and four ballistic submarines in the region.

Appraising the higher alert status of forces in the region, Orange followed suit while calling on the Hague Court of Arbitration to seek economic compensation from Yellow for the loss of their satellite. Orange also stopped public transmissions of Red and Blue through its commercial satellite network.

Meanwhile, Blue issued a statement in the media stating: "Any conventional action in space that destroy space assets and creates debris is to be avoided at all costs by all stakeholders." It also warned, in public, "[r]efugees moving into Blue territory will require military protection in case of retaliation by Red." Yellow, too, issued a statement, proposing bilateral public discussions with Orange and declaring that the downing of the satellite was a mistake.

Move 2/In-Brief for Move 3

By the end of Move 2, the conflict had escalated. Irregular Blue SOF groups entered Red territory to assist pro-Blue militants. Blue's two carrier groups and 15 destroyers were operating in close proximity to Yellow's three aircraft carriers, 20 frigates, 23 destroyers, 20 attack subs and four ballistic submarines in seas close to Red maritime boundary. Meanwhile, protected SATCOM downlinks against

Blue along Blue–Red border had been restored. Blue deployed 1,000 tanks and 2,000 artillery pieces along its border with Red. It also used manned and unmanned ISR capacities to track Red forces, in addition to using ISR SIGINT to obtain protected Red military information. Blue communicated to the control cell that it had “jammed Red’s missile warning systems and SSA ground stations,” although the control cell adjudicated this to be disinformation given that Red did not possess any such capabilities.

Meanwhile, Yellow (Red’s security guarantor) continued with a high-alert status of its forces against Blue. Yellow was prepared to compensate Orange for the destroyed satellite if there was no further escalation. Orange, by skipping the move entirely, signalled that it was willing to wait and watch how the situation evolved. Facing a serious threat of a Blue invasion, Red pushed for truce: it reached out to Orange to influence Blue. However, it also continued to beef up its security in partnership with Yellow.

Major announcements in the media reflected various non-military steps taken by the parties involved to de-escalate. Red and Orange signed a bilateral technology-exchange agreement. This step made good Red’s offer of ISR technology and neutrality in the Hague Arbitration to Orange in exchange for its influence over Blue. To make peace with its minorities, the Red leadership announced, “We have successfully completed talks with Red minorities’ leaders. Peace is restored. All advised to abstain from responding to malicious propaganda.” It also announced, “Space is a global common. We invite multilateral cooperative efforts towards mitigation and removal of space debris [from the Orange satellite].”

Blue’s social-media trolls publicly criticised the Orange leadership of being spineless and passive; #OrangeisthenewYellow trended on social media, thanks to a large state-orchestrated media operation. Yellow publicly announced, “We have restored Blue’s protected SATCOM downlinks along Blue-Red border as a gesture of good faith. We would like to see a de-escalation of forces on the Red-Blue border.” Nevertheless, it also articulated its alliance commitments by stating, “We stand by our Red allies and we view the Blue deployment on the Red-Blue border as provocative and as disproportionate to the need to protect refugees. We hope that Blue will scale down its forces.” In addition, Yellow—in a show of magnanimity—declared that it would lower its alert status once Blue withdrew its forces deployed along the Red–Blue border.

Move 3/End-Of-SIMEX Debrief

The exercise ended with no firm indication of de-escalation. Blue had been cyber-attacked. Yellow had deployed six SOF groups and 50,000 personnel into the Red territory to deter a large-scale Blue invasion, thus holding up its alliance

commitment. It also jammed Blue's military PNT signal localised to border region. It allocated co-orbital ASATs near protected SATCOM satellite(s) in GEO against Blue. Most significantly, it carried out a cyber attack on Blue ISR satellites, raising the possibility of significant escalation. Orange skipped Move 3, a sign the control cell interpreted as a calculated attempt at de-escalation.

While media headlines continued to report the incipient conflict along the Red-Blue border, private channels of communication between the parties involved—monitored by the Control Cell—remained active. Orange proposed four-party talks, to which Red agreed. Yellow supported this call with the caveat that Blue stand down first. Blue, on the other hand, appeared unsatisfied with Orange's call and criticised it for looking the other way while Blue minorities were persecuted in Red. "Technology Exchange Agreement [is] nothing but a bribe to that end," Blue media claimed.

Blue also remained unconvinced that Red had indeed held talks with its minority leaders and denounced its statement to that effect. Its intelligence services claimed that the persecution of Blue minorities in Red continued. Accordingly, Blue called for elections in Red, denouncing the Red government as "fascist," bent on conducting an "ethnic cleansing" of its minorities. Its international statements mirrored this line. Blue further went on to state, "It is committed to de-escalation provided that rights of minorities are protected. It would be a shame if the choice came down to all-out conflict versus a democratic election." Blue's state-sponsored social-media activists made #MakeElectionsNotWar a trending topic.

Yellow, in a show of strength designed to assuage its ally, declared, "We are undertaking joint military manoeuvres with Red, and urged Blue to undertake immediate de-escalation." Yellow further urged de-escalation on the premise that all parties had accepted four-way talks.

ENDNOTES

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7. A caveat is important here. For this to be as unobtrusive as possible, the Control Cell did not introduce recording devices inside each team. Doing so would have undoubtedly given a richer picture of how certain decisions were taken and why, but would have perhaps also resulted in more muted in-group discussions.
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10. For a scholarly discussion of how social media campaigns form a part of the Russian hybrid warfare doctrine, see: Bettina Renz and Hanna Smith, *Russia and Hybrid Warfare: Going Beyond the Label*, Aleksanteri Papers (Helsinki: Aleksanteri Institute, University of Helsinki, 2016), <https://www.stratcomcoe.org/download/file/fid/492>.