

Japan's Balancing Between Nuclear Disarmament and Deterrence

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TRANSCRIPT

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Yuki Tatsumi: Well, good afternoon. People may be trickling in a little bit, but we'll go ahead and start. Welcome to Stimson. My name is Yuki Tatsumi, and I am a co-director of East Asia Program and the Director of Japan program here at Stimson. Today I am delighted to introduce our most recent publication – that is what we named as the *Views from the Next Generation* series. This is the project that has been ongoing for last five years including this one. The purpose of the project is to introduce rising scholars in Japan who works in various foreign policy issues to the Washington, D.C. audience. They are already pretty well-known in Japan, and therefore in high-demand, but for various reasons, they really haven't had much opportunity to travel and speak on their own and share their thoughts on the public form like this. So the *Views from the Next Generation* series every year, we pick each topic whether its regional or functional, and then we identify four to five scholars in that area. And we ask them to write a short policy paper, not the long academic ones, but a short work, and then we make it into a compiled and edited volume, which I think is outside of this room, so feel free to bring your own copy either before or after this event. This year, given the – given what is going on in Iran and North Korea, I thought nuclear deterrence and disarmament, which is the conundrum for Japan's postwar foreign policy, might be a good topic to tackle, and these four scholars is going to make us a little smarter about how Japan looks at the various aspects of this issue. Speaking – sitting right – immediate left to me is Dr. Heigo Sato. He is from Takushoku University. He is the exception in this – well, I mean, he is not a new generation. He has been in the area for quite a long time. So I did ask him to write about kind of capstone piece that actually looks at the – really, this dilemma that Japan's foreign policies have between its very strong commitment to nuclear disarmament but the reality necessity to maintain a strong nuclear deterrence. Next to him is Dr. Mukai. She teaches at Asia University in Tokyo, and she is one of the rising scholars that looks at the nuclear deterrent and the regional security. And she will focus – I asked her to focus on the East Asia. Next to her is Dr. Masahiro Kurita from the National Institute of Defense Studies, who looks at the South Asia example and what Japan may be able to detect from that as Japan tries to grow up with the ongoing North Korea nuclear problem. And when Japan looks at the nuclear deterrent issue, it is almost – how the U.S. looks at this is integral part of the strategic thinking, so I asked Dr. Murano, who is sitting far left of me, to look into that. We are missing one author, if you already looked at the index of it. Dr. Okuda who looked at the Iran Nuclear Agreement, is not able to join us as he is in the job transition, but we did catch him in a video, so after Dr. Kurita's remarks, we will broadcast a short video in which he will talk about his own

segment of his paper. And Dr. Sato actually flew in from Japan this morning, so I want to give him a little buffer, either his flight delay or immigration long line, which is not unusual these days. So I first asked Dr. Mukai to start talking about her new chapter and we’ll go down toward the end to Dr. Murano, and then we’ll cycle back to Dr. Sato to wrap up. I asked each of them to give roughly a ten minutes’ initial remarks and then after that we will dive into the Q&A and we will welcome your comments as well. So with that, Mukai-san?

Wakana Mukai: Thank you – is this on? Thank you very much, Yuki-san, and also to the Stimson Center, for giving me this wonderful opportunity to not only write a paper but also to come to Washington, D.C., which I seldom do, and to talk about nuclear deterrence and nuclear disarmament, and the role that Japan should take, and the policies of Japan should go. So, as Yuki-san said, one of the biggest challenges Japan faces today I think is to seek a balance between the policy of nuclear deterrence in the short-run, and – but also at the same time think about the policy of nuclear deterrence in the longer-run. And to make this decision on which position to take, I think is not an easy task. And of course, when we look at the framework from East Asia, there are a lot of factors that can shape or determine or maybe change the way that Japan would go or the security situation as a whole in East Asia. But here, in my paper, I actually focused on three factors which I think are important when we think about Japan’s policy towards the future. And these three are: the first is North Korea, the second is China, and the third is the Treaty on the Prohibition of Nuclear Weapons. So I am going to go through one by one, and try to talk a little bit about the current situation and the problems that we can – can be raised from that situation. And at the end I would boldly like to recommend three suggestions toward Japan’s future. So the first is North Korea, and we all know that North Korea has been engaging in multiple nuclear and missile tests for the last – for the past few years. It has a young and aggressive leader which is engaging in brinkmanship, and does not so much care about being isolated from the rest of the world, let alone criticism by the international community. Now things may move a bit in a way unexpected, since now we might have the possibility of President Trump and Kim Jong-un meeting in May. But I believe that we cannot be over-expecting the situation or be too optimistic about the situation, since North Korea has not really changed its game that it has engaged in the past. So the challenge from the North Korean situation is that – with a big question mark for Japan – is that, are we – in this “we” I think Japan and also the international community – but are we prepared to live with a nuclear North Korea, or are we determined to seek a path for it to give up its nuclear arsenals. So there are two paths that we can think about. Unfortunately, none of the measures that have been taken so far have led North Korea to shift its nuclear policies and let go of its nuclear weapons. And so the current situation only can allow Japan to rely on the nuclear umbrella provided by the United States, as a security tool, since clearly the security environment in East Asia is deteriorating. So, this leads to the second point that I want to make – is about China. And China has been aggressively expanding its military budget for at least a quarter century at a very fast pace as you all know. It is developing and improving its nuclear and missile capability, advancing its comprehensive military modernization program, which altogether is a part of its efforts to improve its ability to conduct and enhance its strategic deterrence capability. Now, these activities, I think, as a sovereign state is completely understandable in a way; yet, China has yet to set forth a decisive future vision of these acts, claiming it to be peaceful development. But it also lacks transparency and this lack of transparency has invited suspicion and concerns from regional countries including Japan. The issue of mistrust and – mistrust of China’s military buildup has been and

continues to be a great concern not only for the regional countries but especially for Japan. But a more complicated question and problem that lies beneath China, I think, compared to North Korea’s case, is that – of course, both countries lack transparency, but when we think about the threat perspective and the wordings used to describe North Korea and China, there are a little difference between these two. So while North Korea is considered to be, and I quote, “the most urgent and dangerous threat to peace and security,” and China is considered to be one of the, and I quote, “strategic challenges to the regional peace and prosperity.” So you see a little bit – a little difference in the wording when you describe the security threat towards North Korea and China. And I think this is because China is considered to be a vital player in the field, for example, in international economy, and has a huge influence throughout the world. And it is easy, I think, to condemn North Korea, with its unilateral character, being the urgent military threat, but we must not forget that China also has its threat buried beneath its legitimate position supported by the rapid economic growth. So, seeing China as a threat versus being a vital player in the international community and in certain international issues is what allows China to take advantage of its current international position, being vague in its military activities without facing a full condemnation as the case of North Korea. So my third point is on the Treaty on the Prohibition of Nuclear Weapons and Dr. Sato, I think, will have a very strong voice in this matter. So I am just going to slightly go through my part. In a more global level – so, I talked about North Korea and China, which is a rather more regional-level issue – but on a more global level, towards prohibiting nuclear weapons, including the creation of the treaty, has somewhat created an environment for countries such as Japan to confront the issue of nuclear deterrence and the future of nuclear weapons as a whole. And there used to always be this implicit gap between the haves and have-nots and also the so-called umbrella states and the purely non-nuclear weapon states. But this treaty has actually elevated this gap into a more explicit one, forcing Japan to give out or concretely let the international community know which position it would take. So this is actually bringing Japan into a position where Japan needs to think about deterrence, disarmament, and its future position. So suggestions for Japan from these three perspectives – and I will lay out three – the first one is to set a suitable environment for nuclear disarmament to be pursued. So, Japan as a country is not in the center position of actually doing something when it comes to nuclear disarmament. Japan does not own its own nuclear weapons, thus decreasing the number of the arsenals that exist in the world today, Japan cannot do that. So, Japan has to think really hard from a different angle how to contribute to nuclear disarmament, not just saying that it promotes nuclear disarmament but actually thinking of practical ways that it can contribute. And if security concerns are considered as one of the strongest motivation for a country to possess nuclear weapons, then I think easing tensions and strengthening confidence and building trust in the region is worth doing. And in the case of East Asia, I think it is an important step to stabilize the region as a whole. Of course, the tricky part is that North Korea already has a certain amount of nuclear capability, so therefore easing tensions and stabilizing the region may not be enough when dealing with the current situation of East Asia, so that’s the tricky part. My second suggestion is a little bit bolder than the first one, but try at least to think or analyze or study, or whichever language suits Japan, but thinking of perhaps moving beyond the notion of the nuclear deterrence in the longer run. It would be important for Japan to think so or at least try to start thinking about that, because it would be an important signal for the international community to let it know that Japan thinks that nuclear weapons may become less important, and I hope so, less important when considering security policies. So Japan is hugely and heavily – is relying on nuclear weapons at the moment; but if we kind of angle in that

position, maybe the international community might get a signal that Japan is trying something in thinking about nuclear deterrence. And my final point or suggestion is finding a way for Japan, perhaps in a longer run, to join the Treaty on the Prohibition of Nuclear Weapons. Now, I understand that currently that is not the position of the Japanese government and there are a lot of conditions that have to be met. But at the same time, I think it is not enough for Japan to simply reconcile its current position. I think Japan has to – again, I think Japan has to also signal out that it is thinking hard and trying to take a unique position in thinking about disarmament and deterrence. One way is to try not to follow the footsteps of the United States too much, but to try and seek its original position at least, or try to find certain conditions that Japan can agree upon when it comes to the Treaty on the Prohibition of Nuclear Weapons. And I will stop here. Thank you.

Tatsumi: Thank you, Mukai-san. So as she alluded to the – Dr. Sato wraps it up in a way that he will cycle back at this issue that Japan is grappling with when it comes to Treaty on the Prohibition of Nuclear Weapons. But this volume actually considers two – I would call it – case studies that Japan needs to be – which is important for Japan when it looks at its most immediate concern, which is North Korea, and one of the case studies comes from South Asia. So, Kurita-san?

Masahiro Kurita: Thank you, Tatsumi-san. Firstly, I want to express my deep gratitude for Stimson and Tatsumi-san for inviting me to this conference. I am mainly working on South Asian security issues, as a researcher of National Institute for Defense Studies, and my personal research interest mainly focuses on South Asian nuclear issues, like India and Pakistan’s doctrine, that kind of things. But recently, actually, the only one topic I am asked to write or talk about is not nuclear – that is China-Pakistan economic corridor. So I am really grateful that I can speak about South Asian nuclear issues. As Tatsumi-san introduced, my chapter is not focusing on – directly on Japanese policy choice on nuclear issues, but kind of lessons, what kind of lessons can we learn from other experience of nuclear proliferation. And my chapter focuses on South Asia. And specifically, my chapter intends to do is analyzing what kind of lessons can we draw from two decades of American engagement with India and Pakistan since their 1998 nuclear tests, about engagement with the new nuclear power, born out of nonproliferation failure to ensure kind of responsible stewardship of the nuclear capabilities. In the first place, India and Pakistan’s nuclearization was a kind of failure of the international nonproliferation efforts. And in the wake of the test in 1998, the United States shifted its goal from lowering back of the nuclear capabilities to kind of matching their policies in the more moderate and responsible direction, in concrete terms, which means that restraining rapid and boundless expansion of the nuclear arsenals, reducing the likelihood of actual nuclear use, and preventing the spread of sensitive materials and technologies from their programs. With these goals in mind, the United States launched engagement with India and Pakistan on their respective nuclear policies at the turn of the century. As you know, twenty years after that, India, with the kind of defensive nuclear posture, and an exemplary nonproliferation record, has come to be regarded as a kind of responsible nuclear state and has basically achieved recognition of its nuclear status in the international nuclear order. In that process, American engagement has played a certain important role in strengthening India’s nonproliferation measures, in particular, its export control system, in the process of the U.S.-India civil nuclear cooperation deal, and India’s gradual accommodation into the international nuclear order, especially kind of multilateral export control

regimes. And besides, such civil nuclear deal or kind of accommodation into the nuclear order have to some extent encouraged India to adopt, kind of moderate, a defensive nuclear posture. On the other hand, Pakistan – Pakistan remains kind of nuclear outlier, still struggling with the stigma of prohibition network operated by Dr. A. Q. Khan, which was revealed in 2004. Because of this program, in Pakistan’s case, American engagement has focused on nuclear security and export control aspect, and on this front it has made kind of tangible and significant achievements. Islamabad has also cooperated very actively to promote kind of its responsible image and gain recognition on par with India in the international nuclear order. However, the long shadow of the Khan network, and Pakistan’s nuclear posture, which is often described as shifting toward more offensive or destabilizing direction, has hindered Pakistan from gaining equal treatment with India, which is serious frustration for Islamabad. So, given these points, so what kind of lessons on engagement with a new nuclear power borne out of nonproliferation failure can be drawn from these South Asian cases? Maybe three points and plus one thing I should mention. First, what we should notice first, maybe we must be cautious in regarding India’s case as a model. India’s case is often described as a kind of success in this kind of engagement. But this success in terms – ensuring responsible stewardship of nuclear capability by a newcomer – was made possible by a unique facilitating foundation which is really unique to India. I mean that, you know, India’s political leadership has traditionally regarded nuclear weapon as kind of political instrument whose purpose is confined to deterring war, and this perception has led to its rejection of so-called nuclear warfighting with a vast nuclear arsenals and sort of sophisticated operational plans. In addition to that, India’s robust conventional defense capability, not only against Pakistan but even against China, since 1980s has also contributed to limiting the law of nuclear weapons in India’s security policies. Moreover, given India’s leadership’s – given India’s political leadership’s inclination toward kind of global nuclear disarmament or nuclear-free world, it was quite natural for New Delhi not to oppose the nonproliferation norm itself even when it was a vocal opponent of the international nonproliferation regimes. And above all, American engagement with India was sustained and actually facilitated by their strategic rapprochement driven by much broader strategic calculation between U.S. and India, like kind of countering China or even kind of commercial interests. And this kind of driver was so strong even to the extent that some problematic aspects of India’s nuclear policies were largely sidelined in the overall narrative of successful U.S.-India partnership or kind of “responsible India.” So, you know, these factors cannot be universal. This is the first point. And second, from this perspective, perhaps we should focus – rather focus on what was achieved in Pakistan’s case. Despite lacking the same facilitating foundation as India, Pakistan cooperated with the U.S. and achieved certain results in ensuring nuclear security and preventing outward proliferation. This is all the more remarkable, considering Pakistan’s deep suspicion of the U.S. and the international nonproliferation regimes. This may suggest two things: one, how strong the incentive for a nuclear outlier to legitimize its nuclear position internationally is, and second, for that purpose, committing to nonproliferation and export control is kind of relatively acceptable way for them to earn points. And third point, as for nuclear postures, implication of broader regional deterrence structure seems significant. On the one hand, in India’s case, because of its robust conventional capability, India can afford to limit the role of nuclear weapons in its security policy, and adopt – can afford to adopt kind of defensive nuclear posture, thereby assuring its international audience. On the other hand, in 2015, when talks on kind of potential U.S.-Pakistan nuclear deal came up, Pakistan refused to restraint its expansion of tactical nuclear weapons, citing the need to counter India’s conventional war doctrine. From Islamabad’s

perspective, what is destabilizing in South Asia is not the tactical nuclear weapons, but India’s limited conventional war doctrine. So this contrast indicates the role of the broader regional deterrence architecture beyond the nuclear level as precondition to elicit restraint from the nuclear power for its nuclear posture. So these three points are the lessons I want to highlight. And finally, let me mention one thing. If we seek a clue to the solution of the proliferation issue, in East Asia, I mean North Korea, by examining the South Asia case, we must take one point into consideration. That is to say, for addressing the North Korean case, unfortunately the South Asian model itself is not a suitable reference point, although respective lessons can be useful. In South Asian case, coercive measures such as sanctions were relatively limited in American engagement with not only India but even with Pakistan, mainly because Washington has interests in improving its relations with both capitals due to other strategic considerations than proliferation, especially in its most crucial phase at the turn of the century. As you know, sanctions imposed on India and Pakistan were far more limited than what is applied to North Korea right now, and even those limited sanctions were lifted relatively quickly. Of course, this is not surprising considering the kind of different legal standings of their nuclear developments. But the point here is that the utility of coercive measures in shaping a new proliferator’s policy cannot be thoroughly explored or examined through the South Asian experience. Maybe we must devise the strategy appropriately balancing coercive pressures and negotiations for North Korea, and in my sense it may look much different from what was adopted in South Asia. I stop here.

Tatsumi: So with that, I think before we go to Murano-san, we’re going to go to the short video from Dr. Okuda, who cannot – who couldn’t travel to Washington to join us for this occasion.

Masahiro Okuda: Hello, everyone. My name is Masahiro Okuda, a student of Takushoku University graduate school of Japan. Thank you for giving me the opportunity to participate in the project, and also I apologize that I cannot attend at today’s conference. This time, I will report with pre-recorded presentation. In my report, I tried to explore the implications from Iran nuclear agreement on security issue of Japan. Specifically, it is a consideration about the problem of negotiation for resolving the nuclear problem of North Korea. I hope this report will contribute to thinking of this recent trend. First of all, I would like to explain my thought on the current situation and the background of the Iran nuclear agreement. The nuclear agreement in 2015 was implemented from January 2016. However, it can be said that it is unstable whether it can maintain the framework of this agreement. An important turning point that led to present the situation was that President Trump did not certify the Iran’s compliance of the nuclear deal. However, the fact that Iran does not violate the nuclear agreement is indicated in the report by IAEA Director General. Because of this, Iran is against the U.S. assessment, and other party of the nuclear agreement also support the nuclear agreement. Meanwhile, there are points that can be found from the more recent statement of the Trump administration. Trump administration has the broader interests than just implementation of the nuclear agreement on issues around Iran. In a statement on January 12 in this year, President Trump has called on review of the nuclear agreement. There are four points around them – it’s showed on the slide – three or four problems of Iran’s nuclear development restriction by nuclear agreement and acceptance of inspection to IAEA. The ratification of IAEA additional protocol by Iran which is also mentioned in the nuclear agreement is thought to help eliminate those concerns. In particular, I would like to emphasize the consideration about the fourth point. It is ballistic missile development in Iran. Iran’s ballistic missile development is also banned in United Nations Security Council

Resolution 2000-231, which approved the nuclear agreement. However, Iran refuses the negotiations because their ballistic missiles are not to deliver nuclear weapon. Trump administration’s policy to Iran nuclear deal is controversial matter; however, such recommendations have shown that the nuclear agreement does not comprehensively solve the problem of Iran. The nuclear agreement showed a way to settle the problem of Iran’s unregulated nuclear development which was levelled in 2002 by returning to the multilateral system of Iran’s nuclear development restriction and the acceptance of IAEA safeguard. Meanwhile, Iranian participation of uranium enrichment technology and previous restrictions on their nuclear development or their missile development issues was scrapped in the process of discussion for the nuclear agreement. In particular, it is important to think about the impact of the nuclear agreement on the security environment in the Middle East region after the establishment of the nuclear agreement. The United States promised to – expansion of aid, including military technical cooperation, to countries in the Middle East. The nuclear agreement showed a way to the resolution of the Iran’s nuclear proliferation program. On the other hand, it can be said that the nuclear agreement has not played a sufficient role to eliminate arms race in the Middle East. Next, I will explain the implication for negotiation with North Korea from the case of Iran nuclear agreement. There are many differences between Iran and North Korea. For example, there is difference in the position in the nuclear nonproliferation regime in terms of the rules that they should go back. In terms of the differences of sanctions – effectiveness of sanctions, I think the differences such as political system and the dependence on the international economy or trade, and the obvious difference is the ability and intention to acquire nuclear weapons. North Korea clearly develops nuclear weapons and nuclear forces. Moreover, they’re achieving it and it is more pressing issue for the national security to South Korea, Japan, and the United States. Under these circumstance, these countries will be the party to negotiation. North Korea is also seeking negotiations with these countries. There’s considered to be one of the differences from Iran’s case. It is possible that the nuclear issues will be treated not only as a violation of multilateral rules but also as a security issue bringing up arms race. On the other hand, it may be more difficult to set a goal and middle point of negotiations and it will probably make the outcome of the negotiations more compromising. For example, as an example of an intermediate point, we assume that on the North Korea’s ICBM development is frozen. Missiles that put Japan at range, such as Nodong or Scud, and the nuclear weapons will be maintained. Of course, there is some means for the security of Japan even in such a situation. For example, if Japan can maintain military cooperation with the U.S, it will contribute to Japan’s security. On the other hand, it will not go away from the composition of arms race competition corresponding to North Korea’s nuclear and missile development and it will remain obstacles to nuclear disarmament policy of Japan. Finally, it is maybe difficult to apply the way of Iran nuclear agreement to resolve North Korea’s nuclear problem. Even if the model of the Iran deal is applied to North Korea, it seems like it will only be a middle point for improvement of the security environment that bring military risk to the region. Thank you for your attention. Thank you very much.

Tatsumi: So his video presentation was something that none of us expected. If you want – if you’re interested in what he looks like, you can find his picture at the bottom of the volume. This is actually a new frontier that he actually opened up with the PowerPoint with his narration. With that, I think we are all kind of surprised to this go in. With that, I will pass the floor to Murano-san.

Masashi Murano: All right. Good afternoon, everyone. At first, I really like to greatly thank the Stimson Center and Tatsumi-san for invitation to me to this publication project. My name is Masashi Murano. I am a research fellow at Okazaki Institute. My personally – my work focuses on the strategic intelligence assessment and U.S. defense policy, especially the nuclear deterrence and conventional deterrence and ballistic missile defense issues and so on. Today, in my opening statement – before that, Mukai-san already pointed out our tough security environment – so I would like to focus on the more specific issues. My presentation and my chapter title is “The 2018 Nuclear Posture Review and Its Strategic Implication in the Asia-Pacific Region,” including Japan. The 2018 Nuclear Posture Review explains the primary roles of two low-yield options as deterrence – deterrence against Russia’s limited use scenario. This assessment is rational and understandable for me; however, these kind of systems have global impact. So they also have very important meanings in the tailored deterrence posture in Asian-Pacific theater. In this sense, I would like to argue that strategic influence of its nuclear force structure and make policy recommendations from extended deterrence and Japan’s perspective. At first, in terms of the declaratory policy, the 2018 Nuclear Posture Review completely denies the sole purpose and nuclear no-first-use policies. It suggests that U.S. nuclear weapons can be used preemptively, not only for retaliation. This seems to be related to the reason why the Trump administration reviewed its nuclear force structure, especially with two yield options. First one is a low-yield Trident D5 SLBM. Another one is the new Sea-Launched Cruise Missile, so called SLCM, as a follow-on system of the nuclear variant Tomahawk, so called TLAM-N. Actually, the 2018 NPR describes like this, with the retirement of TLAM-N following the 2010 NPR, the United States currently relies almost exclusively on its strategic nuclear capabilities for nuclear deterrence and assurance for allies in Asia. I think this is an important explanation, so as it is in Japan, a number of media tend to focus on the size of yield and the size of warhead. However, what matters is not only the size of the yield, but also the characteristics of the delivery systems. For example, the 2010 NPR has explained that role of the retired TLAM-N could be the substituted by strategic bombers and globally deployable Dual-Capable Aircraft, or DCA. Certainly, these aerial assets can deliver B61 variant – this is one of the existing low-yield gravity nuclear bomb – and its visibility is effective as deterrent signal. In addition, bombers with nuclear air launch cruise missiles will provide the essential flexibility for the regional tailored deterrence posture. On the other hand, strategic bomber cannot stay in the same airspace for a long time. And also the promptness of the subsonic weapon systems is not enough to attack time-sensitive targets such as load-mobile missile launchers. Furthermore, even if Japan abolished the three non-nuclear principles especially banning the introduction of the nuclear weapons, I don’t think it is not effective – it is not effective way to deploy the DCA with B61 to forward bases in Japan. So why is it a problem? The reason relates the anti-access/area denial environment. So for instance, the U.S. stealth dual-capable aircraft such as F-35A and the strategic bombers are hard to detect and intercept in the air. So North Korea and China’s leaders have some incentive to use their theater-range missiles early in a confrontation to counter perceived U.S. advantage for power projection capabilities. So this is because detection and neutralization have a much higher probability of success while these assets are on the ground. So if they – China or North Korean leaders misunderstand the rapid deployment of these assets as intended for tactical nuclear preemption, they may be driven in their analysis to exploit so-called “window of vulnerability” to degrade and/or neutralize U.S. capability on the ground in Japan or Guam with a conventional or nuclear first strike scenario. Although the 2018 Nuclear Posture Review maintains the possibility to deploy the DCA and non-strategic nuclear weapons in

Northeast Asia, but considering the risk of undermining the crisis stability programs, I think the NATO-like, DCA-based extended deterrence posture has not been applied in Asia. On the other words, underwater-based low-yield nuclear option can fill the escalation ladder gap caused by the retirement of TLAM-N. The 2018 Nuclear Posture Review emphasis on the U.S. counterforce capabilities and the specific tailored deterrence strategies for each country is described. The demand for these low-yield weapons seems to have been considered based on capability assessment through some classified war games and specific nuclear operational plans. Considering counterforce targeting in view of the fact that the nuclear forces of Russia, China, and North Korea are composed mainly of load-mobile systems, so it makes sense to target assets such as mobile launchers and their shelters, or hardened silos. So there are only ICBM or SLBM means to prompt a disarming attack on these hardened or time-sensitive targets. However, nuclear warheads currently tipped on Minuteman-III ICBM or Trident D5 SLBMs have very high yields of at least 100 to 300 kilotons to destroy a hard target. So if a surface explosion occurs with a large amount of fall-out, so they cannot be easily used to the counterforce without collateral damage. On the other hand, the new options, the low-yield D5 – the low-yield Trident D5 choose a trajectory that can be launched from anywhere and can avoiding to the discrimination problems. Furthermore, if ballistic missile submarine approach the target and launch, they can shorten the time to impact, and reliably penetrate advanced air missile defense systems. For example, if Trident D5 is fired from nearby the water – nearby to Guam, it will be able to destroy the North Korean mobile missile bases within 18 minutes. So this is faster than waiting until the tactical fighter aircraft is ready and flies over North Korea from in Japan or even South Korea. This advantage cannot be substituted by Dual-Capable Aircraft, air-launched cruise missiles, or even sea-based cruise missiles. Actually, the speed of sea-launched cruise missiles is inferior to SLBM. But unlike strategic bombers, it is possible to sustain in the same – in some specific area for a certain period of time and move to closer the target. Unlike the ballistic missiles, it is an advantage that cruise missiles can change their target information after its launch. It is possible to supplement that limited number of ballistic missile submarines with other attack submarines to distribute that limited – to distribute potential vulnerabilities. This is because the Virginia-class attack submarine, the Block IV version, would play an important role. If it used to the common vertical launching systems, theoretically it is possible to equip the surface vessels with sea-launched cruise missiles, but usually Aegis destroyers need to equip various weapon systems, such as some Standard Missiles, to use for the missile defense missions. So therefore, due to the cruise missiles, it is undesirable for a limited number of ballistic missile defense-capable Aegis destroyers to reduce the capacity for Standard Missile 3 and SM-6. Therefore, the new sea-launched cruise missiles should be installed on the nuclear attack submarine, not the surface or the ballistic strategic cruise missile submarine – that it should be installed on the nuclear attack submarines like TLAM-N. So taken together, although the low-yield option is to raise Russian opposition to the intermediate nuclear force ban treaty violation as a surface reason, in reality it is a flexible option to deter North Korea and China, and it plays an important role in reassuring East Asian allies, including Japan. So for further deepening the extended deterrence commitment, the current framework of the extended deterrence in Asia today is, first, the flexible strike capability consisting of nuclear and the conventional forces; second, the comprehensive and robust missile defense; third, joint commitment through military exercise; and fourth, the consultation mechanism on extended deterrence. I think this structure has not changed so much that previous –previous means the 2010 Nuclear Posture Review – and the combination of hardware and software are basically

appropriate. Then, what kind of the measures are necessary to further deepen these cooperative relationships? Now, I would like to recommend the new appropriate mix of the regional deterrence structure by the hardware and software solutions. I would like to pick up a few – a number of policy recommendations. First, the upgrading the extended deterrence dialogue, so called EDD. The extended deterrence dialogue is one of the consultation mechanisms for strengthening and deepening mutual understanding of the deterrence of the U.S.-Japan alliance which has been regularly held since 2010. And the latest extended deterrence dialogue have held last week at Bangor SSBN base in Washington state. In addition, I think we should conduct a joint exercise on extended deterrence and sharing and formulation of operational plans, including nuclear first-use scenario. Therefore, seamlessly constructing its escalation ladder from the gray-zone to conventional and nuclear domains, a more specific form of nuclear option should be guaranteed. Based on these plans, it is desirable to repeatedly conduct the U.S.-Japan joint exercise involving not only U.S. Forces of Korea and U.S Pacific Command, but also U.S. Strategic Command to constantly check and share the practical issues. Among the exercises are the risk of forward deployment of DCA at the time of crisis, the military and political utilities of increasing the presence of the dual-capable aircrafts and strategic bombers, and the frequency of deployment of strategic ballistic missile submarines in Guam, as well as low-yield Trident D5 or nuclear sea-launch cruise missiles against time-sensitive targets such as mobile missiles, based on the necessity to use them as a prompt disarmament means at appropriate time, which should also be verified in each operational planning. The second is robust multilayered regional and U.S. homeland missile defense and defeat. This element, it is extremely important that the Japanese government decided to acquire Aegis Ashore – it is a land-based Aegis system, BMD Aegis system – and SM-6, in strengthening the multilayered U.S.-Japan joint missile defense to cope with an adversary’s combination of ballistic and cruise missile salvo attack. So in order to strengthen missile defense, the coordination of not only interceptors but also sensor networks is indispensable. So in this sense, the strengthening terrestrial laid networks – terrestrial forward sensors deployed in South Korea and Japan will contribute not only to defense of Japan, but also to ensure defense of Guam, Hawaii, and U.S homeland. We should also advance technical cooperation in space-based sensor layer, such as the hosted payload of space-based kill assessment satellites and pre-boost phase defense technology such as the “left of launch.” Third, the strengthening anti-submarine warfare against SLBM/SLCM threat and providing U.S. submarines operational assurance. I already mentioned about this point regarding the nuclear force posture, the 2010 NPR – the 2018 Nuclear Posture Review does not deny the possibility to deploy the DCA and non-strategic nuclear weapons in Northeast Asia, but in view of the anti-access/area denial environment, which is expected to become more severe in the future, so it seems too hard to continue to identify these assets as deployable. So as a result, it is expected that the U.S. nuclear force structures in the Asia-Pacific region will tend to rely on submarine-based systems. So in particular, in order to maximize the deterrent effect and its – if its potential efficiency to tactical trident and flexible prompt strike capabilities and nuclear sea-launched cruise missiles, which is relatively slower and shorter than SLBM, so the allies including Japan should firmly conduct anti-submarine warfare in the surrounding waters to assure that the U.S. submarine forces can focus on their deterrent mission. The force – the technical cooperation for research and development, offensive and defensive hypersonic systems. The – actually, the Trident D5 SLBM is sufficient to penetrate the existing adversary’s air defense systems. However, before United States, China and recently President Putin just revealed – they already have development of various hypersonic systems, such as hypersonic boost gliders, as well as

air-breathing systems. So in particular because of their altitude and unique trajectory, the hypersonic boost gliders cannot be intercepted by the existing mid-course missile defense systems such as the SM-3. So we should consider defensive measures against hypersonic systems and also we need to consider how to offset them by the offensive hypersonic – tactical hypersonic systems. In this context in Japan, we’ll begin the fundamental research studies of short-range boost glide systems on fiscal year ’18. So this is aimed to the remote island defense, but technically it is similar to the conventional prompt global strike technologies, so – and depends on the boost glider, it could extend range to the ILBM class. So to accelerate this practical use, it may be preferable to apply the hypersonic technologies with the United States and other partners. And finally, to strengthen Japan’s intelligence, surveillance, reconnaissance capabilities, and to develop the counterattack capabilities, as a part of allied missile defense and defeat systems. In considering damage limitations, it is better to have more strike capabilities, so Japan should seek limited counterattack capabilities besides the F-35 with the standoff cruise missile, something like JASM or Joint Strike Missiles, and a combination of the submarine and the Tomahawk can also launch a combination of submarine and Tomahawk, can be considered. The latest version of Tomahawk can also be launched from torpedo tube. It will fit Japanese submarines without vertical launching systems. So moreover, even if Japan has its own capabilities, they will be functioned within the framework of the U.S.-Japan alliance. So Japan’s counterattack capabilities are intended to limiting damage from the second or third waves of attack rather than the deterrent by punishment. So even if Japan can prevent to the first attack – first salvo attack it can reduce and suppress the adversary’s number of remaining missiles before the next wave. So probably – the probability of interception by missile defense improves. So it is important to note the target – targets and the different priorities of different countries. So therefore when conducting the joint operations, the closer prior consultation on target selection and identification is required. So in doing so, Japan possesses its own ISR capabilities, and it is important to gather intelligence from the peacetime to coordinate adaptive and joint targeting coordination with the United States. So in this regards, equipped with targeting sensor of the Global Hawk acquired by Japan will have to deepen our extended deterrence dialogue with more practical joint exercise. Let me stop here. Thank you very much for your attention.

Tatsumi: Thank you, Murano-san. So lastly by not least, Dr. Sato, who – Sato-san – is this on? Right? [Gestures to microphone] So Sato-san will talk about Treaty on the – Treaty on the Prohibition of Nuclear Weapon and Japan’s dilemma facing this.

Heigo Sato: Thank you, Yuki. Good afternoon, everyone. My name is Heigo Sato. Can you hear me? And I am a professor at Takushoku University in Japan – Tokyo. And I have been here, actually, for a while, and Yuki and I had been in a joint project in the Stimson on nonproliferation and other issues, and I had been contacting with Brian, which is the president of this institute, for a while, because he covers export control, which I – which is a topic I have been covering for most of my academic life. So as you know – as you see through my face, through my face, I am not a young and aspiring researcher here. I had been in D.C. in the middle of the nineties, and then I came back and forth, debating about various issues related to the U.S.-Japan security alliance and the major issues which I have been dealing with this year is about exactly this topic: the balancing between nuclear extended deterrence and disarmament, of course. And this topic is especially important for us because it is often criticized, not just from the United States but from the global community, that Japan’s policy is – seems to be rather

hypocritical, or rather contradicting, or conflicting, because at one point we pursue about nuclear deterrence and strengthening the extended deterrence tie with the United States, as outlined by Mr. Murano, and at the other point we are strongly advocating about the nuclear disarmament, which we had a history of in Hiroshima and Nagasaki, which is the first and I hope it will be the last nuclear weapons dropped on the human beings. And the Japanese government had been very active on claiming for the total abolition of the nuclear weapons. And those conflicting demands are always a topic of our security debate in Japan, and maybe for the rest of the world who watches Japan’s security policies. And one of the reasons why this conflicting debates emerged in Japan’s security debate is – one of the answers for myself is that there are many security discussion community within Japan who strongly argue about nuclear extended deterrence and others being arguing about the nuclear – exclusively on the nuclear disarmament. So the debate, at one point, is very – seems to be very rational, very realistic and hard – hard-nosed, but the other thinks that it is more soft and more demanding to the United States, maybe, or maybe more idealistic or maybe liberal in a sense. So those two demands, or those two security communities are really interactive with each other, and I hope – I think this is a very good opportunity here presented by Yuki that Murano – Mr. Murano and Dr. Mukai sit together debating about Japan’s security policies, yeah? And unfortunately the other – Okuda – who is actually the – a student of mine from his master’s thesis – and he just got Ph.D. thesis in this March – March 15, so please congratulate him online – but anyhow, this type, this opportunity is very precious for us, and for myself, when we are talking about those two balances, balancing, I was asked at one point last year, at one point, to discuss about the nuclear prohibition treaty, or simply the ban treaty, and its implication to the Japan security debates, and I presented a short paper online, actually, and I made some comments on the TV and media, and I was severely actually criticized from the both camps. The security guys were arguing that you are not thinking seriously – seriously about the security policy of Japan, and the disarmament community are saying that you are a demon or someone, that you are not seriously considering what Obama administration had pointed out, and that is a global goal, and the goal which the human beings should be pursued – pursuing. But those conflicting demands actually was very serious when the Abe administration had to make a choice whether they should join the treaty or not. And my take – my argument was that Japan should not agree on the ban treaty because of the two reasons. I think it is elaborate in the – in this paper here. One point is that the ban treaty itself is a good treaty but it is counterproductive, as Dr. Mukai has pointed out, that it will divide the nuclear have and have-nots so that it will be – create a reconcilable nature in the global communities that – there will be no practical policy measures left for the ban treaty groups, so that it will make the – create a permanent divide between those two camps. So I thought Japan should not participate in this debate, and it was clear from the outset that the ban treaty group were trying to induce Japan or nuclear umbrella states so that those states joining the treaty might put pressure on the N5 or the nuclear weapon states to abandon the nuclear weapons in the context of extended nuclear deterrence. So in the – I elaborated more in my paper, but I thought the ban treaty group was the first, you know, step or first move or first initial step towards the new ban treaty, was to limit the extended deterrence of the N5 to the allied countries. So I thought it was counterproductive so that I was strongly opposed to the ban treaty by itself, for itself. And the second reason I thought was the U.S.-Japan alliance and the reason why the ban treaty is counterproductive to the Japan security policy and the nuclear disarmament at the same time – I think he elaborated in Mr. Murano’s presentation – if Japan should join the ban treaty it might create a condition where we or Japan’s security policy might have to rely on the nuclear weapons, although it is contradictory. But facing the threat

from North Korea and PRC – China – we have no choice other than to rely on our nuclear – nukes if we are to get rid of the U.S. nuclear extended deterrence. And as you know, those conditions are totally chaotic and I thought it is not quite – not quite easy to make, at least, and it is also counterproductive for the U.S. global strategy at the same time, which Japan supports – supports them and rely our security measures through which – through which. So my simple answer to my question, or a simple conclusion towards the ban treaty debate is that we should not join if we want to strike the balance between nuclear deterrence and disarmament itself. And after I – releasing this statement in Japanese and thanks to Yuki it is in English at this point, Japan’s reaction is very negative, honestly speaking, but I hope this is one way to evaluate those gaps and how to strike the balance – it should be the centerpiece of the Japan security policy, and I hope that the debate would continue to be rich and productive in a manner that it could create a more stable or make more – reconciliatory atmosphere between the security communities in Japan. So that will end my presentation.

Tatsumi: Thank you, Sato-san. We have a few minutes for questions and answers, so if you can – there’s a microphone so – the gentleman on the corner and then Hisano-san right here. And if you can – if you question is targeted to just one of them, if you can just specify that, that will be great.

Steve Winters: Steve Winters, independent consultant. I’d like to direct this to Murano-sensei because you’re so knowledgeable about these technical details. I want to pose this question. Vice Admiral Oda retired, formerly head of the Japanese Defense Intelligence Agency, stated a few years ago at Johns Hopkins SAIS that the moment Japan no longer believed in being covered by the U.S. nuclear umbrella, that Japan would go with its own nuclear weapons. That was his statement. So I would like to ask you – with these various other countries, people talk about the breakout time. You know, for instance, with Iran does a breakout time of one year, two – well, I’m sure you’re familiar with that term. And I know the CIA has an estimate for the breakout time if Japan were to decide to have its own nuclear weapons. What is your estimate for the breakout time of Japan, should they decide to get their own nuclear weapons?

Murano: Yes, thank you so much. I have a specific view about the breakout time of our nuclear – the arming for indigenous development – indigenous nuclear weapons. But I have another view about the nuclear arming of Japan. Of course if we are able to develop the indigenous nuclear weapon in the short time, I think that we couldn’t maintain the nuclear sanctuary, something like the nuclear bastion, like if we develop the nuclear weapons, we are knowing to the – how do we deliver those kind of systems. Probably we couldn’t develop. We didn’t acquire the strategic bombers, the – or land-based system is not feasible, so the most feasible option is submarines, but the – in this situation, we already probably – I mean, the U.S. already maintain – hard to maintain the nuclear sanctuary of the SSBN under the sea superiority or sea dominance. When we think about our strategic environment to maintain some nuclear submarine bastions or some sanctuaries, it is – probably in this situation it will be hard to maintain those kind of environment to maintain the survivability of our submarine, if we equipped with some nuclear missiles.

Winters: So what’s the breakout time for Japan?

Murano: I don’t have some specific views about the breakout time.

Tatsumi: Hisano-san.

Tetsuro Hisano: I am Tetsuro Hisano from Mitsubishi Heavy Industries America. So, I think that May is a very important time because JCPOA – Mr. Trump will decide to – whether he will provide very strong sanctions towards Iran or not. And also May – Mr. Trump might meet Mr. Kim Jong-un. And also North Korea and Iran has a very close tie in terms of the nuclear weapon development and the missile weapon development. So if Mr. Trump cannot succeed in – revise the current JCPOA, the sunset clause and other missile defense prohibition, they – if Mr. Trump cannot succeed in revising the JCPOA, Mr. Kim Jong-un might think that the United States is not so strong, like the paper tiger, then the sanction is a very important measure in the peacetime, but how do you think Japan – how can Japan contribute to such sanction? So – but when we think about the sanctions in Iran, the – China is a strong supporter to Iran or maybe Pakistan also. China has a strong relationship with Pakistan and the North Korea also. China has a very critical role they provide. In case of North Korea, China has so far – has cooperated, but when we think about Iran and the North Korea both, how can Japan contribute to the U.S. plan to make these things happen?

Tatsumi: Who’s a taker? I’ll let you all think about it. In the meantime, I’ll take a second question, and then – this gentleman.

Hank Gaffney: My name is Hank Gaffney. I worked in Defense for 28 years, in the Center for Naval Analysis for 23. 13 of my years were based intensively on the NATO nuclear problem. And another 13 years of discussions with the Russians on the whole strategic business. But let me say this. Of course, the U.S. went wild in the fifties on – and ended up with huge numbers of strategic weapons and what we – what I call theater weapons – I do not use the word tactical, especially the first time I ever ran into the West Germans. And, oh, first of all I never, in my 13 years working NATO, ever heard the term extended deterrence. That is what scholars use maybe, but the fact is we were rooted in Europe. We never used the term. Now, of course, there is that question of how rooted we are in South Korea and Japan, and we could discuss that. But the point is, both ourselves and the Russians never found any plausible options for use, and I barely heard the term deterrence come up, and it needs to be a far greater discussion of what deterrence is. Now, with the Soviets in the U.S., it ended up in – by 1972 as balance in the numbers to keep in balance. By the way, I should mention that my favorite Russian strategic thinker who headed their analysis division for strategic rocket forces noted that we – both we and the Soviets – Russians – needed 70 tests of any missile to be sure that they were useful, that is, to do what they were supposed to do, especially with accuracy. But the second thing about – he said about missile defense –

Tatsumi: Sir, I don’t mean to –

Gaffney: Yeah – is that it takes five defensive missiles to catch any offensive missile, but the question is, why don’t you discuss deterrence more?

Tatsumi: So I think with the two together – can Japan contribute – how can Japan contribute – how well and in what way Japan can contribute to the sanctuary regime vis-à-vis Iran or vis-à-vis

North Korea, depending on how things go in May, and why are we hearing more about extended deterrence but not the straight-on deterrence per se? I think there are some people – some hard-nosed security people – does talk about deterrence, so maybe I will first pitch it to Murano-san maybe, and then others can pile on, especially with the question on the North Korea and Iran, and since Pakistan is coming up, Kurita-san, that’s going to be you.

Murano: I would like to ask about – the second question, about why we didn’t talk about deterrence. In my view, including the preemptive option and how do we retaliate to them, or preparing for some flexible option, is part of deterrence. This is because if we are faced to some specific scenario such as, you know, as you may know, the NATO assumed to some specific limited nuclear use scenario by the Russian non-strategic tactical weapons under some Baltic invasion scenario – this moment the United States currently has just a huge number of – huge – very, very large-yield options like the ICBM or the SLBM. In this situation, the United States, to protect our allies, including NATO and Japan, they have no choice but have no choice but to start the full scale nuclear war or surrender. So I will – we need to avoid this situation. So flexible nuclear option is one of the important roles and the flexible nuclear option is one of the effective way to deter some number, to create it – to the effective – the escalation battle. Of course, the nuclear weapon is not only the specific way to deterrence. Our deterrence posture includes not only nuclear weapons, but also conventional weapons systems and the ballistic missile defense systems. I would like to argue, to emphasize on the appropriate mix of those kind of weapon systems. So this is the broader comprehensive force posture provided the effective deterrence. So my argument is that, including the deterrence element.

Sayuri Romei: Sayuri Romei, Sasakawa USA. I had a question for Dr. Mukai. So I was listening to your recommendation about moving beyond deterrence and coupled that with your remarks about easing the tensions in the region. I was thinking – I was wondering if you were also thinking about a nuclear weapons-free zone in the region, and there have been many proposals over the years, and if you were thinking of any steps towards that goal, or if you had in mind any new proposals about it. Thank you.

Mukai: Thank you very much for your question. Personally, I think that having a nuclear weapons-free zone in Northeast Asia is extremely difficult, simply because we have North Korea and China. And personally I think that excluding these two countries and building a nuclear weapons-free zone is not worth doing. I mean, if you want to have a zone such as the ones we have in Latin America or Central America or Africa, we need to include every country that is at stake. And for the foreseeable future I think that including North Korea and China is impossible. My wording’s maybe a little bit tough, but I think it’s impossible in the near term. So for concrete steps, if we can’t have a zone, then what can we do, and one of the steps that I’ve mentioned in the paper is of course easing tensions and confidence-building measures. And I think all these will maybe ultimately bring us to a path that we can at least consider or talk about building these zones in the area. But for a foreseeable future, I think it’s impossible.

Tatsumi: Sato-san, you have something to add. I’m sorry.

Sato: I do want to answer Mr. Hisano’s question about sanctions. As you know, the JCPOA is a multi-year, multinational effort which had been accumulated for years. And it is based on the

assumption that Iran have to have – we – other country have to save Iran’s face, because they also had faced the domestic problems a lot. So just depriving their nuclear capacity overall is not a good option for them for the domestic policy of Iran itself. So with that in mind, just revising the JCPOA is a very complicated task, I think. And in Japanese policy community it is still the pessimism that Trump can succeed to do so. But with regard to sanctions, Japan is relatively objective to what the U.S. and the international community are trying to do, and others are just cooperating to strengthen the sanctions. I think they are just following the lead of the U.S. and the international community. So the straight answer to your question about how can we contribute to the sanctions itself is just to follow the rules set by the international community.

Tatsumi: Last question goes to – over there –

Jade Wu: Hi, my name is Jade Wu. I’m a foreign affairs author. Can any of you comment on the funding for nuclear weapons if Japan should choose to go that – go down that road? What I’m wondering is – I understand the Japanese economy is coming out of a slump in recent years. Wouldn’t this be a strain on the Japanese economy to get nuclear weapons? If you look at a nation like North Korea, they’ve stunted their growth so that they can afford this. So where is this money going to come from?

Tatsumi: I think my – I mean, I’ll start and everyone can pile on after me – but I think that’s why you’re not hearing Japan going nuclear. I mean, that’s – that’s kind of obvious. Because your question fundamentally pursues that Japan will someday might go that way, but if you look at any economic indicator and demographic indicator, fiscally that is not a sustainable policy – a realistic policy option. And rather more sensible option is for Japan to have a smarter choice between what it invests in ballistic missile defense and what it invests on the conventional defense capabilities. So that like – I’m going to – Dr. Murano alluded to have a better, appropriate, more, I guess, fiscally responsible and efficient mix of capabilities to counter this. But that is – fiscal is part of the reason why. There were a couple of times if you look at Japanese debate – domestic debate on nuclear policy whether should – does it make sense for us to go this – that was always an undercurrent deterrent, that it never really gained a core traction within the policy community even. And first step will be for Japan to withdraw from NPT. And that will blow – that will be a fundamental damage to Japan’s international reputation, as even those – even those more of a hardline security policy researcher, I mean, policy scholar would agree. Everybody else, please pile on. I took a first crack at it. *Douzo.*

Sato: I should have the younger ones answer, but if you’re not – I will try to add on to Yuki’s point. The fiscal burden is very trouble if Japan decides to go nuclear. And we have been debating this issue for about twenty, thirty – decades. And each – last debate I remember is after just – after the Cold War, which – whether we should go nuclear or not. And the answer was even – it was the bubble economy, which Japan’s economy was booming – the answer to that was we should not because of the fiscal burden or because of the NPT violation and other reputational issues as well. So – but, yeah, other debate which currently going on in Japan is that whether we – could we rely more on the missile defense capabilities or not. And the debate goes on, and I don’t think that conclusions are yet reached, but the debate would say that even relying on the missile defense is fiscally very strained for us. As Murano-san pointed out that we are purchasing the Aegis Ashore from the United States, but even the Aegis Ashore itself is good for

our security purposes but it is not for our fiscal realities. So we are debating whether we have another option to make, for example, like robotic, space, cybers, and we are trying to search for every other option which is fiscally sustainable and the security – for the security-wise it is beneficial for our security policy at last.

Tatsumi: Anything else? All right. And the time now is – I’m sorry, we went over three minutes but I would like to thank all of these people. Actually, everybody either arrived in the United States yesterday or in the case of Dr. Sato this morning, and some of them have to turn around and go home tomorrow. So I would like to thank all of them for coming such a long way for – to talk about their paper, and thank you all for coming, and if you can join me thanking all these wonderful authors, that would be great. And thank you for coming.

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