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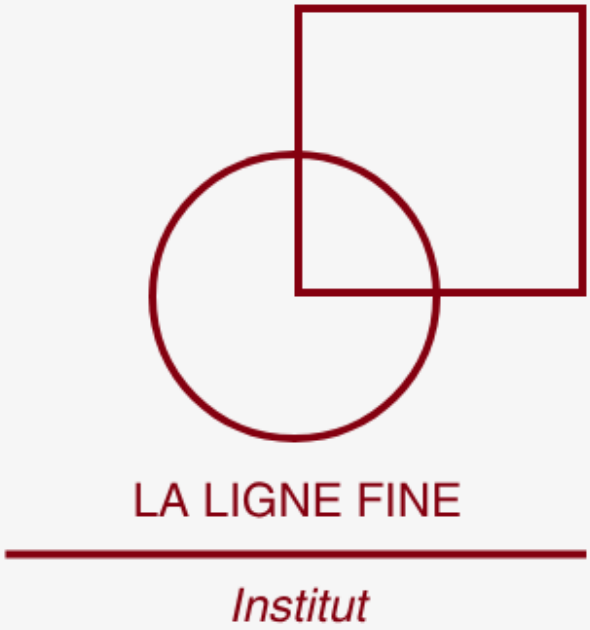

Nuclear deterrence in the hypersonic age

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Hypersonic weapons do not disrupt nuclear deterrence because they would simply be faster. Their strategic effect is due to the combination of three factors: the reduction in decision-making time, the uncertainty about their trajectory and the ambiguity of their load. They do not remove the second-strike capability of nuclear powers, but increase the risk that a crisis will be interpreted, decided and escalated in timeframes that are incompatible with strategic prudence.

The real shift is therefore not the transition from a deterrence that has become useless to a new technological domination. It lies in the gradual deterioration of the conditions of legibility on which the nuclear balance was based: identification of the attack, attribution of intent, distinction between conventional strike and nuclear strike, communication between adversaries and political control of escalation.

Introduction

Nuclear deterrence is based on a seemingly simple proposition: no rational adversary will engage in an attack that he knows would cause unacceptable damage in return. This proposal, however, never depended solely on the destructive power of the arsenals. It also assumes that actors can detect an attack, understand its nature, identify its origin, preserve a response capacity and have sufficient time to decide. It is precisely this decision-making environment that hypersonic weapons complicate.

The term mainly covers two categories of systems: hypersonic gliders, carried at altitude before evolving according to maneuvering trajectories, and hypersonic cruise missiles, propelled into the atmosphere at very high speed. The crossing of Mach 5 is not, in itself, a revolution: strategic ballistic missiles have long reached higher speeds. The decisive difference lies more in the combination of speed, manoeuvrability, less predictable trajectories and, for some systems, a flight altitude that makes them difficult to detect and intercept. The American authorities thus acknowledge that these weapons are particularly difficult to track because of their low and evolving trajectories[1].

The issue must therefore be properly formulated. Hypersonic does not suddenly create nuclear vulnerability. Since their inception, strategic arsenals have lived under the threat of rapid and devastating strikes. On the other hand, it intensifies the problems of perception, warning and interpretation that determine whether a confrontation can remain under control. The question is not whether the hypersonic weapon will abolish nuclear deterrence, but whether it will make its operation more nervous, more opaque and more prone to error.

[1] Vergun, D. (2023, May 10). *General says countering hypersonic weapons is imperative*. U.S. Department of War. https://www.war.gov/News/News-Stories/Article/Article/3391322/general-says-countering-hypersonic-weapons-is-imperativ

I. The real issue is not speed, but the compression of decision-making

The current presentation of hypersonic weapons insists on their speed as if it were an absolute breakthrough. This reading is insufficient. An intercontinental ballistic missile is already capable of covering strategic distances in a few tens of minutes. Since the Cold War, nuclear decision-makers have been faced with extremely tight deadlines.

The specific contribution of certain hypersonic systems lies in their ability to maintain uncertainty for longer on their trajectory, their exact target and sometimes their mission. Where the classic ballistic trajectory theoretically makes it possible to estimate an impact zone fairly quickly, a maneuvering vehicle can modify its course and delay the identification of the final target.

This uncertainty puts direct pressure on the chains of command. When a decision-maker does not know whether the weapon detected is aimed at a conventional site, a command centre, an early warning infrastructure or a nuclear component, he or she must reason from the most dangerous scenario. Strategic rationality then becomes paradoxical: the more incomplete the information, the more the actor can be encouraged to decide quickly to avoid losing his or her decision-making or response means.

Hypersonic thus reinforces the problem of "use it or lose it": the fear of seeing a capability destroyed before it is used. This vulnerability is particularly relevant to command systems, radars, policy centres, strategic communications, and inadequately dispersed or protected nuclear delivery systems.

The threat therefore does not necessarily lie in the actual destruction of the opposing force. It lies in the possibility that the latter believes that it is threatened with disarmament and adapts its posture accordingly. A system may be technically survivable and politically perceived as vulnerable. However, in the nuclear field, perceptions produce strategic effects as powerful as the capabilities themselves.

II. The hypersonic does not suppress the second strike, but it feeds the fear of losing it

The stability of deterrence depends less on the absolute invulnerability of arsenals than on the certainty that a sufficient part of them will survive a first attack. As long as an adversary knows that it cannot eliminate the ability to retaliate, a disarming strike remains irrational. From this perspective, hypersonic weapons do not automatically upset the nuclear balance.

Nuclear ballistic missile submarines remain extremely difficult to locate and neutralize simultaneously. Mobile missiles, dispersion, hardened silos, redundant transmission systems, and bombers on alert also contribute to the survivability of forces. The strategic effect of a limited number of hypersonic delivery systems therefore remains insufficient to guarantee the complete disarmament of a major nuclear power.

The continued modernization of the nine nuclear arsenals also confirms that States do not consider their capabilities to be rendered obsolete by the appearance of new delivery systems. SIPRI believes that a new nuclear arms race is developing in a context of weakening arms control regimes and continuous modernization of forces[2].

But the lack of real capacity to disarm an adversary does not prevent the spread of the fear of disarmament. As soon as a state invests in weapons presented as capable of penetrating defenses, striking nerve centers and reducing the warning time, its competitors are led to consider their use in a first-strike strategy, even when this function is not explicitly claimed. The dynamic becomes self-fulfilling.

The power that develops the weapon claims that it seeks to strengthen its penetration capacity and therefore its deterrence. The adversary sees this as a threat to the survivability of his forces. It is spreading its resources more widely, increasing their alert level, possibly delegating certain procedures, developing new vectors and investing in similar capacities. Each actor then presents its modernization as a defensive response to that of the other. Hypersonics does not therefore mechanically destroy strategic stability. It fuels a competition about the possibility of destroying it.

[2] Stockholm International Peace Research Institute. (2025, June 16). *Nuclear risks grow as new arms race looms—new SIPRI Yearbook out now* [Press release]. https://www.sipri.org/media/press-release/2025/nuclear-risks-grow-new-arms-race-looms-new-sipri-yearbook-out-now

III. The ambiguity of the charges blurs the line between conventional and nuclear war

Perhaps the most destabilizing problem is not the speed of the vector, but the opponent's inability to quickly determine what they are carrying. Some hypersonic systems are designed for conventional loading. Others may be associated with a nuclear mission. Still others operate in military architectures where the same platforms, infrastructures or chains of command participate in conventional and nuclear functions.

For the state that detects the launch, this doctrinal distinction is difficult to observe. A radar does not identify a political intention. It detects an object, estimates a trajectory and tries to anticipate its target. He cannot guarantee that the charge is conventional, nor that the attack will remain limited. This ambiguity produces several risks.

The first is that of a nuclear interpretation of a conventional strike. An operation to destroy an air base, ship, missile defence infrastructure or regional command centre may be seen as a prelude to a broader strategic attack.

The second is that of the "entanglement" between conventional and nuclear forces. When the same infrastructure contributes to the conduct of both categories of operations, a conventional strike can degrade the adversary's nuclear capability without this effect necessarily being intended. The targeted State may, however, consider that its deterrent system is being intentionally attacked.

The third is that of escalation through ignorance. A power may believe that it is using a precise and proportionate conventional instrument, while the adversary places it in a scenario of nuclear decapitation or neutralization.

The distinction between conventional and nuclear power, which is already politically fragile, thus becomes less technically legible. However, deterrence presupposes that the signals are clear enough for each actor to understand the cost he is about to cross. As delivery systems become versatile and military architectures integrated, the nuclear border remains legally and doctrinally affirmed, but operationally more uncertain.

IV. Hypersonic proliferation transforms a bilateral equilibrium into a multidirectional problem

The nuclear stability of the Cold War was already precarious, but it was based primarily on a structured confrontation between two superpowers. Doctrines, arsenals and arms control mechanisms had gradually been designed in a bilateral logic. The current environment is different.

The United States and Russia retain the largest nuclear arsenals, but China is rapidly developing its capabilities. Other nuclear powers—France, the United Kingdom, India, Pakistan, North Korea, and Israel—operate in distinct regional environments, with unevenly transparent doctrines, thresholds, and warning systems. Modernization is no longer just about warheads, but about delivery systems, missile defenses, space assets, cyber capabilities, and command systems[3]. Hypersonics is part of this multiplication of actors and interactions.

A capability designed by the United States to meet a regional need can be interpreted by China as a strategic threat. A Chinese modernization thought out in the face of the United States may affect India's calculations. An Indian evolution in turn changed the Pakistani perception. Russian capabilities simultaneously influence American, European and Chinese reasoning.

Deterrence is therefore no longer reduced to a stable relationship between two comparable arsenals. It becomes a network of intersecting vulnerabilities in which a decision made in one theatre produces effects in several others.

This shift makes arms control more difficult. An acceptable limitation in a bilateral relationship may appear disadvantageous if it does not take into account the strengths of a third actor. Each power is then afraid of constraining itself in the face of one adversary while remaining exposed to another.

The expiration of New START in February 2026 has reinforced this void. This agreement capped the strategic nuclear weapons deployed by the United States and Russia and provided a framework for transparency, even if it was already severely degraded before its end. Its absence does not automatically lead to an immediate and unlimited expansion of arsenals, but it does remove an instrument of predictability at the very moment when competition is becoming more complex and technological[4].

The strategic problem of hypersonics is therefore not only that of a new weapon. It is that of a new weapon introduced into a system where the mechanisms of limitation and verification have been designed for another age.

[3] SIPRI Yearbook 2025 Chapter, Stockholm International Peace Research Institute. (2025). *SIPRI Yearbook 2025: Armaments, Disarmament and International Security – Chapter 6: Nuclear disarmament, arms control and non-proliferation*. https://www.sipri.org/yearbook/2025/06

[4] Essay by SIPRI Stockholm International Peace Research Institute. (2026). *After New START expires, Europe needs to step up on arms control*. https://www.sipri.org/commentary/essay/2026/after-new-start-expires-europe-needs-step-arms-control

V. Missile defences alone will not restore stability

In the face of hypersonic weapons, the most immediate response is to improve the means of detection, tracking and interception. Investments in space-based sensor constellations, radars, data processing and interceptors are set to increase. NATO has also integrated ballistic and hypersonic threats into its air and missile defence policy[5]. This adaptation is necessary. However, it is not a complete strategic solution.

No defensive system guarantees absolute protection against a sophisticated, massive or diversified nuclear attack. Defenses can protect certain sites, complicate enemy plans, and reduce damage. They can also contribute to deterrence by reducing the attacker's confidence in the success of their operation.

But at the same time, they can produce destabilizing effects. When a state strengthens its interception capability, its adversary may fear that this defense will only be used after a first strike that has already reduced its forces. An officially defensive architecture can then be interpreted as part of a strategy combining a preventive attack and neutralization of residual retaliation.

The adversary is encouraged to increase the number of vectors, to multiply decoys, to diversify trajectories and to develop systems capable of saturating or bypassing the defence. The relationship between offensive and defensive becomes cumulative: more missiles generate more interceptors; More interceptors justify more missiles.

Missile defense can protect. It cannot, on its own, recreate the trust and predictability that is essential for nuclear stability. NATO itself recognizes that missile defence complements nuclear deterrence without being able to replace it[6].

[5] NATO's Integrated Air and Missile Defence Policy. North Atlantic Treaty Organization. (2025, February 13). *NATO Integrated Air and Missile Defence Policy*. https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2025/02/13/nato-integrated-air-and-missile-defence-policy

[6] Communiqué of the Brussels Summit. North Atlantic Treaty Organization. (2021, June 14). *Brussels Summit Press release*. https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2021/06/14/brussels-summit-communique

VI. The real break is political: deterrence becomes more automated and less deliberative

As the time available shrinks, the temptation to rely on automated devices to detect, merge, and interpret information grows. Artificial intelligence can help filter masses of data, identify signatures, estimate trajectories and speed up alerting. It can improve situational awareness. But its insertion into nuclear chains also introduces a new vulnerability: that of an excessive reliance on systems whose reasoning, biases and reactions to new situations are imperfectly mastered.

The danger does not necessarily lie in the direct delegation of the decision to fire to a machine. It can be apparent well before, when the technical architecture determines the options presented to the decision-maker, the degree of certainty associated with the alert and the speed with which a situation is qualified as an attack.

The temporal compression then modifies the very nature of the political decision. The decision-maker no longer has real time to deliberate, consult, test hypotheses and interpret opposing intentions. He must choose between options already prepared, on the basis of probabilistic information, for fear that waiting will make any answer impossible.

A deterrence based on a controlled political decision thus risks slipping into a deterrence based on organisational reflexes. However, military organizations tend to favor operationally prudent scenarios: assuming the worst, protecting capabilities, shortening procedures, and avoiding paralysis. What seems rational at the level of a chain of command can become catastrophic at the level of the international system.

The strategic challenge of the hypersonic era is therefore less to maintain a technical capacity to respond than to preserve a political capacity not to retaliate too quickly.

VII. Limits and point of resistance: hypersonic is not an autonomous revolution

It would be excessive to attribute to hypersonic weapons all the current weaknesses of nuclear deterrence. First, their operational effectiveness remains variable. Programs are expensive, testing complex, and real-world performance often difficult to distinguish from political or industry communications. The U.S. Government Accountability Office has identified cost, schedule and technology readiness risks in several programs developed by the Department of Defense[7].

Secondly, not all systems described as hypersonic are of the same strategic interest. Some are essentially airborne ballistic missiles or regional range systems. Their ability to alter a global nuclear balance must be assessed on a case-by-case basis.

Third, the main factors of stability remain the survivability of forces, the robustness of command, the quality of intelligence, doctrinal coherence and the existence of political channels. A power with a credible submarine component and resilient communications retains a second-strike capability, even in the face of fast, maneuverable weapons.

Finally, a hypersonic weapon does not have an intrinsic strategic significance. Its effect depends on its number, accuracy, range, charge, doctrine of use, and the targets for which it is intended.

Hypersonic is therefore neither a miracle weapon nor a context-independent breakthrough. It acts as a multiplier of instability in a system already weakened by competition between powers, the erosion of arms control, the duality of delivery systems, the integration of the cyber and space domains and the deterioration of strategic communications.

Conclusion

Hypersonic weapons do not end nuclear deterrence. As long as the powers retain survivable forces capable of inflicting unacceptable damage, the basic logic of the second strike remains. But this permanence must not mask the real displacement.

Nuclear deterrence is becoming more difficult to interpret, faster in its operation and more dependent on complex technical systems. The trajectory of a weapon is less predictable, its charge may be ambiguous, its target uncertain and its launch likely to be associated with a conventional operation as well as a decapitation strategy.

Hypersonics does not suppress nuclear rationality; it reduces the time in which it can be exercised. Under these conditions, the response cannot be limited to developing faster vectors or more efficient interceptors. It must address the political architecture of stability: the protection and dispersion of forces, the securing of chains of command, the maintenance of substantial human control, test notifications, targeted doctrinal transparency, crisis channels, and arms control arrangements tailored to conventional and dual-capability nuclear systems.

The decisive challenge of the hypersonic era is not to prevent all vulnerability. It is to prevent uncertainty, speed and the fear of losing the initiative from transforming a manageable crisis into an irreversible decision.

[7] U.S. Government Accountability Office. (2024, July 29). *Hypersonic weapons: DOD could reduce cost and schedule risks by following leading practices* (GAO-24-106792). https://www.gao.gov/products/gao-24-106792