

## The militarization and weaponization of space : towards a European space deterrent

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Defensive in its first decades, the use of space for military purposes has now become offensive. The concept of militarized outer space has been replaced by that of “weaponized” outer space. International law in space only strictly prohibits putting weapons of mass destruction into orbit. The threat of conventional arms development, mainly targeting the destruction of operational military satellites, is one which may not be prevented simply by diplomatic activity, an approach to which France has been wholeheartedly committed. In this context, a “European space deterrent”, based on the expression of a strong European foreign policy and on the development of independent means for orbital surveillance of ballistic and space launches, and indeed retaliation if attacked, including a rapid response capacity and small dedicated launchers, seems in itself to secure a space which, used for the social and economic development of France and Europe, will become more and more important in the next few decades. Such an asset would place Europe on an equal footing in dialogues with the United States in the context of a NATO equipped with interoperable space assets.

### Space: for peaceful purposes or a future theatre of conflict?

The conquest of space, started at the end of the fifties, coincided with the beginning of the Cold War. It was an integral part of the East-West confrontation. With their political and technological rivalry, the United States and the USSR gave a military aspect to space with the commissioning of ballistic missiles and the launching of the first artificial satellites. The other members of the UN Security Council have followed suit. And still others have gone down this path, wishing to exert regional influence. The People’s Republic of China and India are clear examples. Simultaneously, civil applications have emerged. They show that States are convinced of their importance in future social and economic development. The countries operating a liberal economy have also encouraged private operators.

The passive militarization of space results in putting into orbit of satellites for reconnaissance, secure telecommunications, space surveillance and eavesdropping. These information gathering technologies contribute to the strategy of States which possess them and provide logistic support to their troops deployed in operational theatres. They don’t however form part of armaments systems with the purpose of neutralizing or destroying the enemy and its capacities. They have, initially, contributed to the stabilization of international relations through their role of overseeing the implementation of treaties on scaling down the arms race.

From the eighties onwards, space systems have started to enter the arsenal of nuclear and space powers. The networks of navigation satellites, GPS in the United States and GLONASS in Russia, with the information they contribute to cruise missiles guidance and constitute a first step toward the use of space as a military resource for destroying enemy forces.

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This development has been amplified during the nineties up to the point where, in the United States, space is an amplifier of forces and a symbol of the revolution in military affairs. From the end of the Clinton administration the “Pearl Harbour” syndrome has held sway, opening the way to a policy of controlling space and more and more overt strategy of space defence.

In this context, the United Nations have developed international law specifically for space. It consists of several treaties, but none have as yet been unanimously ratified by its members. The 1967 Treaty, on the peaceful use of extra-atmospheric space, was drawn up by the United States and the USSR. The general principles on which it is founded have an ethical and moral character. It is the result of a compromise which had to ensure neither side could gain the advantage from their activities in outer space. These two superpowers had to maintain a balance either by prohibition or by the limitation of certain uses. In particular, putting weapons of mass destruction, particularly nuclear, into orbit was prohibited. However, an ambiguity remained in article IV. It stipulates "not placing such arms, in any way, in extra-atmospheric space ". The use of missiles in outer space is therefore not excluded. However, the same article says that “all States, party to the Treaty, will use the Moon and other celestial bodies for exclusively peaceful purposes". So this formula leaves the possibility of using extra-atmospheric space for military purposes.

If the principle of a peaceful use of outer space has clearly been stated, it is in fact just a form of words. Its systematic repetition in almost all the resolutions and declarations would give the impression that it is laid down as the mandatory moral rule of international law. But it doesn't ensure the demilitarization of space: if the Moon and the other celestial bodies constitute a “demilitarized zone”, earth orbit, from which weapons of mass destruction are excluded, does not have to be free of military activities judged to be non-aggressive like, for example, spying, telecommunications or positioning.

### The Weaponization of space

The military use of space is not however limited to these “defensive” applications. The concept of militarized outer space has been replaced by that of “weaponized” outer space. The expression “weaponization of space” defines the process which results in the deployment of weapons in space which may then become a theatre of conflict, a battlefield, by the use of weapons aimed at destroying targets either in orbit or on the Earth's surface. The arming of space constitutes a destabilizing factor for international relations.

The media coverage of the interception test successfully carried out by China on 11 January 2007 on one of its satellites (Feng Yun 1C, “wind and clouds”) by a rocket derived from a solid propulsion ballistic missile, finally drew the whole world's attention to the technological capacities of some States which have this as their aim. This interception is the conclusion of a phase of technological demonstration which included three other attempts since 2004, which it is difficult to say were failures or merely preliminary verifications. Indeed, the Americans had themselves developed such systems but decided against their deployment. And the Soviet Union had its own projects. Do the Russians still possess such systems? No visible activity has been observed on since the end of the communist regime. So the Chinese test surprised and shocked us as something of an anachronism, especially as it was a success. This sudden reappearance of anti-satellite weapons makes them now no longer a monopoly of the American strategists but common property of the whole international community.

It is however to be feared that these events only give a partial view of the programmes of the most advanced space powers intending to equip themselves with attack capacities which can be described as “weapons in space”. It is quite possible in fact that the weapons race may in the future take place in other directions than nuclear, space systems being part of one of the elements (C4ISR<sup>1</sup>, reactive infrastructure) of the “new triad” defined in the *Nuclear Posture Review 2002*, constituting an important “layer” in anti-missile defence.<sup>2</sup> Since the withdrawal of the Americans from the ABM treaty, the legal vacuum concerning the aggressive use of space seems clearer and clearer. Moreover, the non-existence of a multilateral forum for discussion and the consideration of questions of peaceful uses for space constitutes a serious handicap while resumption of the Conference on Disarmament talks doesn't appear to be very realistic.

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<sup>1</sup> C4ISR : Command, control, communications, computers, intelligence, surveillance, reconnaissance.

<sup>2</sup> See the testimony before Congress (HR) for the presentation of the 2008 budget of the BMD of Lt Gl H.A. Obering, director of the Missile Defence Agency (27 March 2007) : “I believe the performance of the BMD system could be greatly enhanced by an integrated space-base layer.”

## The development of concepts for the use of Space for diplomatic purposes

Attacks on military or dual purpose satellites belonging to other States may cover several different methods of action: intrusion in vital satellite systems and the ground segment which control them, electronic jamming, ionizing and electromagnetic effects produced by high altitude nuclear explosion, destruction by means of kinetic or directed energy anti-satellite weapons (powerful microwaves, laser weapons) from the ground or from space. The putting into orbit, on standby, of military payloads which may then subsequently be desorbited and directed at targets on the ground has also been studied. Although their accuracy is debatable, their feasibility is beyond doubt. They could be thought of as conventional weapons of mass destruction.

The G.W. Bush government's new American space policy (National Space Policy) of October 2006 asserts the principle of freedom of action in space. It rejects any limitation on the right, which is considered to be fundamental, to use space, including its "weaponization" when the vital interests of the United States are threatened.

The Chinese anti-satellite weapon test has relaunched the debate on the risks which will be run if arms are used in space, risks which may effectively become threats to other States. The relative moderation of the American comments which followed and the indifference displayed by the Chinese in the face of the disapproval of the most vocal countries illustrates once again the asymmetrical strategy of this country and while it has the capacity to anticipate such an event America hasn't attempted to dissuade it.

Indeed, the destruction of one of its satellites doesn't constitute an aggressive act on the part of the Chinese. It appears as a natural consequence of the arrangements for the use of orbital space. The situation would have been completely different if the destroyed satellite had belonged to another country. However, with respect to the arrangements recently approved by the Committee for the peaceful use of outer space (COPUOS), the Chinese test is wholly condemnable in terms of the additional pollution of space which it has generated. In effect, the presence in orbit of a large amount of debris arising from the collision contributes to a growing risk factor for satellites and for the safety of the crews of manned spacecraft. It is becoming extremely worrying.

Safety in space, which the United States, as also China, each in their own way claim to wish to maintain, also corresponds to the position of France and Europe. China, like India and Japan, has been speaking for a long time in favour of disarmament in space. A possible reading of the technological demonstration of last January is that it is attempting to convince the Western powers by a show of strength apparently contrary to its professed aims. The United States, whose economy and global defence network depends more than any other country on its space systems, seems clearly to be moving towards a reopening of discussions on security in space so as to reunite around it those wishing to codify and control space security, resulting in something like what already exists for air traffic. The recent attempts by the Chinese, including that denounced by the Americans, to illuminate one of their satellites with a laser beam, proves that most space powers which possess satellites or manned spacecraft in orbit are interested in providing space with a real framework for control which guarantees its security.

Very many analyses and recommendations have been made in past years by States, in the appropriate multilateral bodies, and beyond this arena by "think tanks" and academic research groups with a view to suggesting ways and means to make outer space safe, to make up for the legal shortcomings of the treaties, or in fact to amend or complete them, or even to propose new institutions and measures which aim at increasing trust among partners.

But the recent events demonstrate the unilateral character of the foreign policy of the United States and China in their use of space to increase their power. China's demonstration of destruction may be interpreted as a response to the American doctrine of the military use of space. As an asymmetric strategy, it finds in the inherent vulnerability of space systems - which are increasing in number and have a key role in the conduct of military operations - an Achilles heel which can clearly be seen to be fragile.

The negotiations called Paros<sup>3</sup> (prevention of an arms race in space) have been moribund for several years, particularly due to the blocking by the United States, in opposition to China and Russia, in particular, who are favorable to the setting up of a new stricter legal framework.

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<sup>3</sup> PAROS : Prevention of an Arms race in Outer Space (theme explored by the Conference on Disarmament which has 66 participating States)

As for France, it is committed to the non-arming of space which it regards as an essential element for international security. It is against any deployment of offensive weaponry and rejects any initiative which may restart an arms race in space. But security in space is not limited to the single issue of armaments : it concerns freedom of access and safety in and of space.

### What is the French position?

Whereas the United States and the Russian Federation possess all the operational capacities necessary for detecting, qualifying and making credible such events, France does not have a global concept for the use of space, even if it has decided, from the beginning of the nineties, to acquire observation satellites (Helios 1 & 2, then Essaim) and secured telecommunications (Syracuse 3) whose protection against electromagnetic radiation has been strengthened. Let's remember that these programmes would not have seen the light of day if they hadn't been preceded in the seventies and eighties by others, less ambitious, with a dual use although essential civil : SPOT and Telecom 1& 2.

It also has a capacity for detecting objects in low orbit : the bi-static radar Graves. Even if this has been able to, a posteriori, identify and analyze the consequences of the Chinese action, its performance is limited, in particular in terms of the size of targets. Consequently, France depends totally on the American capacities for identifying and dating monitored events. In practice, the burden of proof for a State, in the case of an attack, means it has to be able to unambiguously distinguish an event from any other which could result from a natural phenomenon or from the failure of one of these orbiting satellites. A system which is independent from the American one is only feasible at the European level: on the one hand, because it would naturally have to be seen in terms of the global objective of the security of the members of the European Union and, on the other, because the multiplication of observation centers would lead to a cost of installation and maintenance which only the Union could finance without a heavy impact on the budgets of the three armed forces.

Incidentally, France is developing a low cost surveillance and ballistic delivery system warning demonstrator, two Spirale mini-satellites. The objective is to test the technologies which may be implemented in future operational systems.

Proposals have recently been formulated as part of a national strategic study for a defence and security space policy (report of the Strategic Orientation Group for Space Policy, "GOSPS"). In essence, the approach aims to ensure the protection of national capacities (protection of satellites), continue the work already undertaken on space surveillance demonstrators then moving on to a more operational system and gradually making it more European, stopping short of encouraging studies on offensive systems in the name of legitimate defence.

In legal terms, no proposal at the national level has been envisaged as far as we know. The draft French law on space, being prepared in the Council of State, deals essentially with questions of the State's responsibility as a launching State, in conformity with the provisions of the 1967 Treaty. Moreover, it takes up the loopholes in international law and proposes an implementation of the national registration of space objects.<sup>4</sup>

### What doctrine should France adopt?

This question is of great concern to us for a reason which became clear with the publication of the declassified GOSPS report entitled "Let's give more space to our defence, Orientations for a space defence policy for France and Europe".

This strategy document, approved by the Ministry of Defence, effectively recommends that France increases its use of space systems. It is for a more advanced sharing of European capacities in this area. A realistic view would include cooperative military operations involving the sharing of some resources at a level where space systems would necessarily be included (C4ISR)<sup>5</sup>. From now on it appears clear that we have to convince our partners of the fully operational capacities of these resources for undertaking missions of defence and security.

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<sup>4</sup> Draft law, pages 73 to 75.

<sup>5</sup> The 2020 vision of AED/EDA shows the importance of C3 and C4ISR.

In these circumstances, the question of their vulnerability and dependability cannot be evaded. Their protection has a cost.<sup>6</sup> Having a reactive capacity available (“responsiveness” as the Americans call it) also has considerable financial consequences. If it happens that there is a trend toward anti-satellite weapons, possibly justifying a reaction from us and investments in technological research, new finance will have to be found for a “Research & Development Common Budget” envelope which is already very limited. In other words, the consequences for France of an active militarization of space will not be felt simply at the diplomatic level, but could have an impact on the orientations of space doctrine and the planning of investments.

In reality, if we consider making of outer space a new arena where the powers may confront each other beyond or in the *continuum* of atmospheric space, or to speak of a necessary securing of transactions in space and recognise the increasing militarization of this environment, we must ask ourselves a basic question, articulated as three points:

1. Do we now, during peace time, have to manage space, whose use is becoming commonplace as an asset, a territory, a means of communication, so that its users may enjoy a minimum of predictable and safe rules of conduct?
2. Can we still hope to demilitarize this environment, in ways to be defined?
3. Do we have to face up to the arming of this “territory” as unavoidable?

If the active militarization, offensive or aggressive (which the Americans call “*counter space*”, “*space denial*”) of space is avoidable, how can we influence the players so that they reject this? In fact, despite having accumulated the technological elements necessary, the United States has not, since the demonstration of 1985, engaged in activities generating debris nor deployed even “simple” weapons. Some American researchers remain convinced that the operational implementation of numerous futurist systems would be random and costly.<sup>7</sup> It is not impossible that the excesses of the Rumsfeld doctrine of the “revolution in military affairs”<sup>8</sup> and the fully technology-oriented policy will be tempered, at least momentarily. If stopping the arming of space is therefore still a realistic objective, we can argue for a European approach - which is still to be organized around the shared views of France, Germany and Italy – quite close to the Canadian position. It would mean an increased securing of the outer space environment for space objects, whether civil or military, by means of rules of conduct similar to those recommended for the prevention of space debris, and/or political declarations drawing attention to the most significant efforts from the responsible nations.<sup>9</sup>

If arming is inevitable<sup>10</sup>, the approach will have to be different, orientated on our own capacities to slow it down and, at the same time, to protect ourselves in legitimate defence : analysis of threats, counter-measures or active and passive protection of satellites<sup>11</sup>, space surveillance and early warning, demonstrators, if necessary the working out of a policy of “space reactivity” with or without the deployment of anti-satellite equipment.-The issue is clearly that France and Europe should not in the future be blind, paralysed, dominated and dependent without some degree of autonomy.

### What steps should Europe take for its defence and security?

Confronted with the phenomenon of the gradual arming of space, France and some of its partners in Europe may, if the hypothesis of a threat was to take form in speeches and deeds, enlarge the range of alternatives open to them : diplomatic action and control of armaments, technological and industrial measures aimed at the development of European capacities<sup>12</sup> – possibly within the NATO framework – of space surveillance and warning systems, and an increase in our national technical capacities which are defensive and, if necessary, active.

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6 Th. Hitchens, *CDI*, Washington DC. And M. Krepon, *Stimson center* at IFRI 4 April 2007.

7 RMA: revolution of military affairs.

8 The “behaviorist” approach, via the obligations on a launch State resulting from responsible conduct is recommended by M. Krepon.

9 New space policy of the White House published in September 2006, doctrine of the Chinese strategies.

10 Upstream R&T and research of DGA, ONERA, DAM.

11 See recommendations of the Assembly of the UEO: Reports “Deployments of armaments in space”; First part: Doc C/1932 16 May 2006 — Second part: Doc C/1966 2 May 2007.

In effect, the Chinese test has shown the incapacity of Europe to detect, characterize and appreciate the potential menace which it constitutes. Only an inter-governmental collaboration within Europe appears appropriate for preparing to deal with such a situation. It would avoid massive investment in fully autonomous resources. The first example we have is the tripartite agreement between France, Germany and Italy for the exchange of high resolution images from the reconnaissance satellites, respectively, Pléiades, SAR-Lupe and Cosmo Skymed, when these three systems are operational.

However, France must continue with what it has already embarked on, on the one hand the operational programmes Helios, Essaim and Syracuse and, on the other hand, the technological demonstration programmes SPIRALE and ELISA, to ensure the continuation of the former and, for the latter, to arrive at operational capacities fit to put at the disposal of the armed forces.

Europe does not have to imitate the United States. It is not exposed to the same risks and has no intention of being a rival as a dominating world power. On the economic level, Europe doubts it has the financial resources to be able to catch up with the United States in terms of the quantity of operational devices, even though it is the second economic power in the world. But having systems which are autonomous and complementary to those of its partners appears to be more and more of a priority, in the light of the recent advances observed in other countries. China has just reminded us of this. Germany has the FGAN-TIRA radar and the United Kingdom the PIMS optical instruments. They provide a capacity for detection, orbitography, the management of a catalogue of orbiting objects and their identification. However, these systems, with Graves, are not inter-operable and don't satisfy the global need for detection, warning and response which future threats will require.

The relaunch of the defence effort in terms of space, which we are advocating, must on one hand include reinforcement of the protection of orbiting systems, naturally those which are exclusively military, but also European commercial satellites which have a role in providing services to the armed forces, and, on the other, make Europe able to anticipate possible attacks from "rogue States" or isolated terrorist groups and able to counter these threats by appropriate means.

The generalisation in the word of the use of space for military purposes with, ultimately, the access of regional and local powers to armament systems which may be used in space, in the first instance inter-regional and inter-continental ballistic missiles, leads us to propose the strengthening of our capacities for monitoring and response.

So in our view the priority must be:

- The establishment of a European doctrine of "strategic space deterrence",
- The development by Europe of an autonomous operational system of "space surveillance" including systems for detecting and analysing objects in orbit and also terrestrial and space systems for detecting and warning of ballistic and outer space launches,
- The identification of critical technologies which France and its European partners will need to possess in order to equip themselves with a credible operational capacity and so reduce their dependence on the United States, allowing them thus to enter into balanced dialogue – this is to be undertaken without delay,
- The undertaking of an exploratory study, as a European collaboration, of anti-satellite devices which do not generate space debris, are ground-based and use directed energy, laser in particular. This may be considered within the framework of the previously discussed doctrine,
- The development of "rapid response" launchers, indispensable to the urgent replacement of vital satellites, so that a limited reserve of launchers may be operationally available.

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