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**China Missile Launch May Have Tested Part of a New Anti-Satellite Capability**

by

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## China Conducts Missile Launch

China on May 13 fired a missile into space, according to a U.S. Department of Defense (DOD) spokesperson<sup>1</sup> and official Chinese press reports.<sup>2</sup> Launched on a ballistic trajectory from the Xichang Satellite Launch Center in western China, the missile reportedly reached an altitude of over 6,000 miles, and possibly over 20,000 miles, before it fell back and burned up while reentering the atmosphere over the Indian Ocean. DOD did not detect the “insertion of any objects into orbit,” and “no objects associated with this launch remain in space,” said the spokesperson. This launch is the world’s highest known suborbital launch since the U.S. Gravity Probe A in 1976 and China’s highest known suborbital launch to date, according to Jonathan McDowell of the Harvard-Smithsonian Center for Astrophysics.<sup>3</sup>

## Scientific Experiment or Anti-Satellite Test?

Beijing claims it was testing a sounding rocket as part of a high-altitude scientific experiment to collect atmospheric data for China’s National Space Science Center.<sup>4</sup> However, U.S. defense agencies reportedly assess the launch was the first test of a new anti-satellite (ASAT) capability, according to two U.S. press reports citing unnamed U.S. officials.<sup>5,6</sup> DOD has yet to *officially* comment on the relationship between China’s May missile launch and its ASAT program.

A Chinese Ministry of Foreign Affairs spokesperson claimed he was “not aware” of an ASAT test, and then reiterated “it is China’s longstanding stance to make peaceful use of the outer space and oppose weaponization and arms race in the outer space.”<sup>7</sup>

While it is difficult to make a solid assessment about the nature of the missile test without more information from DOD or China, available data suggests it was intended to test *at least* the launch vehicle component of a new *high-altitude* ASAT capability.<sup>8</sup> This also would be consistent with previous reports that China had developed a new ASAT weapon system and was preparing to test it.<sup>9,10,11,12,13,14</sup>

If the test is part of China’s ASAT program, Beijing’s attempt to disguise it as a scientific experiment would demonstrate a lack of transparency about its objectives in space. Furthermore, such a test would signal China’s intent to develop an ASAT capability to target satellites in an altitude range that includes U.S. Global Positioning System (GPS) and many U.S. military and intelligence satellites. In a conflict, this could allow China to threaten the U.S. military’s ability to detect foreign missiles and provide secure communications, navigation, and precision missile guidance. Beijing’s destruction of an aging Chinese FY-1C weather satellite in January 2007 demonstrated it has the capability to target U.S. satellites orbiting in *low Earth orbit*, such as remote sensing satellites.

It is not clear what type of attack mechanism the new ASAT capability is designed to employ. For example, it could use a “kinetic kill vehicle” to disable or destroy a satellite through the force of a direct collision. The new ASAT capability also could employ electronic warfare or directed energy weapons to temporarily degrade a satellite’s capabilities without permanently destroying or damaging it.<sup>15</sup>

## China’s Counterspace Capabilities and Strategy

China is pursuing a flexible, “multi-dimensional” developmental program to “improve its capabilities to limit or prevent the use of space-based assets by adversaries,” according to a DOD report.<sup>16</sup> In addition to ASAT kinetic kill vehicles, China is developing and fielding other methods

and technologies to attack satellites while improving its space surveillance coverage.<sup>17</sup> Beijing appears to be developing this array of capabilities to deter U.S. strikes against China's expanding satellite infrastructure; challenge U.S. information superiority in a conflict; and deny, degrade, disrupt, disable, or destroy U.S. satellites if necessary. These objectives probably are driven by Beijing's assessment that U.S. military space doctrine advocates for militarizing space and attacking an adversary's space assets in a conflict.<sup>18,19,20,21</sup>

PLA doctrinal publications<sup>22</sup> and other military writings on space warfare<sup>23</sup> suggest China's counterspace strategy has coalesced around the concept of "space deterrence." This concept calls for China to develop a strong counterspace capability to deter an adversary's use of its own counterspace systems. PLA strategists likely consider counterspace weapon systems to be more valuable deterrents than nuclear or conventional capabilities because the threshold for use is lower.<sup>24,25</sup>

There is little publicly available information on China's plans to employ counterspace weapons in a conflict, though some operational principles and elements of its strategy can be gleaned from PLA doctrine and authoritative Chinese documents.<sup>26</sup> Beijing probably recognizes an unrestricted space war would quickly escalate,<sup>27</sup> encourage other countries to become involved, and create debris that could damage its own satellites. This suggests Beijing during a conflict likely would not conduct preemptive kinetic strikes against U.S. satellites and initially would use disruptive, reversible counterspace systems, such as electronic jammers. If Beijing judged a conflict had developed to the point where destructive, irreversible attacks were necessary, it probably would attempt to destroy a limited number of satellites to degrade specific U.S. capabilities, rather than seek to destroy all U.S. satellites.

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<sup>1</sup> DOD's full statement: "We detected a launch on May 13 from within China. The launch appeared to be on a ballistic trajectory nearly to geosynchronous Earth orbit. We tracked several objects during the flight but did not observe the insertion of any objects into orbit and no objects associated with this launch remain in space. Based upon observations, we assess that the objects reentered the atmosphere above the Indian Ocean. We defer any further questions to the government of China." Andrea Shalal-Esa, "U.S. sees China launch as a test of anti-satellite muscle: source," Reuters, May 15, 2013. <http://www.reuters.com/article/2013/05/15/us-china-launch-idUSBRE94E07D20130515>. Also see The Space Report, "Kunpeng-7." <http://planet4589.org/jsr.html>.

<sup>2</sup> Xinhua's full statement: "This test used a high altitude space probe rocket, which carried a payload of multiple scientific detectors such as Langmuir probes, high energy particle detectors, magnetometers, and barium powder release test devices, etc. to perform original state detection of high energy particles and electromagnetic field strength in the ionosphere and near earth space." Xinhua, "China Successfully Carries out a High Altitude Scientific Measurement Test," May 14, 2013. OSC ID: CPP20130514003004.

<sup>3</sup> Jonathan McDowell (Harvard-Smithsonian Center for Astrophysics), e-mail with Commission Staff, May 22, 2013. Also see The Space Report, "Kunpeng-7." <http://planet4589.org/jsr.html>.

<sup>4</sup> Xinhua, "China Successfully Carries out a High Altitude Scientific Measurement Test," May 14, 2013. OSC ID: CPP20130514003004. Also see Xinhua, "China conducts scientific probe in high-altitude atmosphere," May 14, 2013. [http://news.xinhuanet.com/english/china/2013-05/14/c\\_132381822.htm](http://news.xinhuanet.com/english/china/2013-05/14/c_132381822.htm).

<sup>5</sup> Andrea Shalal-Esa, "U.S. sees China launch as a test of anti-satellite muscle: source," Reuters, May 15, 2013. <http://www.reuters.com/article/2013/05/15/us-china-launch-idUSBRE94E07D20130515>.

<sup>6</sup> Bill Gertz, "China Conducts Test of New Anti-Satellite Missile," *The Washington Free Beacon*, May 14, 2013. <http://freebeacon.com/china-conducts-test-of-new-anti-satellite-missile/>.

<sup>7</sup> China Ministry of Foreign Affairs, "PRC: Foreign Ministry Spokesperson Hong Lei's Regular Press Conference on May 14, 2013," May 14, 2013. OSC ID: CPP20130515968206.

<sup>8</sup> For an overview of the different classes of orbit, see NASA Earth Observatory, "Three Classes of Orbit." <http://earthobservatory.nasa.gov/Features/OrbitsCatalog/page2.php>.

<sup>9</sup> Andrea Shalal-Esa, "RPT-China's space activities raising U.S. satellite security concerns," Reuters, January 14, 2013. <http://www.reuters.com/article/2013/01/14/china-usa-satellites-idUSL2N0AJ10620130114>.

<sup>10</sup> Taipei Central News Agency, "Beijing to Trigger Arms Race by Testing Anti-satellite Missiles," January 13, 2013. OSC ID: CPP20130115968204 1427

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- <sup>11</sup> Gregory Kulacki, "Is January Chinese ASAT Testing Month," *Union of Concerned Scientists: All Things Nuclear, Insights on Science and Security*, January 4, 2013. <http://allthingsnuclear.org/is-january-chinese-asat-testing-month/>
- <sup>12</sup> Department of Defense, *China: PLA Activities Report 16-31 Oct 2012*, October 31, 2012. OSC ID: CPP20121120440020.
- <sup>13</sup> Xinhua, "China Dismisses Report on Planned Test Launch of Anti-Satellite Missile," October 25, 2012. OSC ID: CPP20121025968325.
- <sup>14</sup> Bill Gertz, "China to Shoot at High Frontier," *The Washington Free Beacon*, October 16, 2012. <http://freebeacon.com/china-to-shoot-at-high-frontier/>.
- <sup>15</sup> For an overview of the different types of ASAT attack methods and technologies, see David Wright, Laura Grego, and Lisbeth Gronland, *The Physics of Space Security: A Reference Manual* (Cambridge, MA: American Academy of Arts and Sciences and Union of Concerned Scientists, 2005). <http://www.ucsusa.org/assets/documents/nwgs/physics-space-security.pdf>.
- <sup>16</sup> U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: May 2013).
- <sup>17</sup> U.S. Department of Defense and U.S. Department of State, *Report to Congress, Risk Assessment of United States Space Export Control Policy* (Washington, DC: March, 15, 2012). Also see William Matthews, "Chinese Puzzle: No Explanation for Complex Satellite Maneuver," *Defense News*, September 10, 2010. <http://www.defensenews.com/article/20100906/DEFFEAT01/9060317/Chinese-Puzzle>.
- <sup>18</sup> Dean Cheng, "China's Military Role in Space," *Strategic Studies Quarterly* (Spring 2012). [http://www.aei.org/files/2007/10/17/20071017\\_SpaceWarfare.pdf](http://www.aei.org/files/2007/10/17/20071017_SpaceWarfare.pdf).
- <sup>19</sup> U.S.-China Economic and Security Review Commission, *Hearing on "The Implications of China's Military and Civil Space Programs*, written testimony of Dean Cheng, May 11, 2011.
- <sup>20</sup> Larry Wortzel, *The Chinese People's Liberation Army and Space Warfare* (Washington, DC: American Enterprise Institute, October 17, 2007).
- <sup>21</sup> Kevin Pollpeter, "The Chinese Vision Of Space Military Operations" in James Mulvenon and David Finkelstein, ed., *China's Revolution in Doctrinal Affairs: Emerging Trends in the Operational Art of the Chinese People's Liberation Army* (Arlington, VA: Rand Corporation and the Center for Naval Analysis, 2006).
- <sup>22</sup> For example, see Zhang Yuliang, ed., *The Science of Campaigns* (Beijing: National Defense University Press, 2006) and Zhou Peng and Wen Enbing, "Developing the Theory of Strategic Deterrence with Chinese Characteristics," *China Military Science*, no. 3 (2004).
- <sup>23</sup> Open Source Center, *Analysis: China's Space Strategy – Views of PRC Academic Community*, September 19, 2008. OSC ID: FEA20080922777119.
- <sup>24</sup> Michael Chase, "Defense and Deterrence in China's Military Strategy," *Jamestown China Brief* 11:5 (March 25, 2011). [http://www.jamestown.org/programs/chinabrief/single/?tx\\_ttnews\[tt\\_news\]=37699&cHash=54744d95d41c1ed6d2a1ceee940b0875](http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews[tt_news]=37699&cHash=54744d95d41c1ed6d2a1ceee940b0875).
- <sup>25</sup> Gregory Kulacki, *Anti-Satellite Technology in Chinese Open-Source Publications* (Cambridge, MA: Union of Concerned Scientists, July 1, 2009). <http://www.ucsusa.org/assets/documents/nwgs/Kulacki-Chinese-ASAT-Literature-6-10-09.pdf>.
- <sup>26</sup> For example, see Peng Guangqian and Yao Youzhi, ed., *The Science of Military Strategy* (Beijing: Military Science Publishing, 2005); China Defense White Paper, *The Diversified Employment of China's Armed Forces* (Beijing: Information Office of the State Council, April 16, 2013); and China White Paper, *China's Space Activities in 2011* (Beijing: Information Office of the State Council, December 29, 2011).
- <sup>27</sup> For a survey of authoritative PLA writings on escalation control, see Lonnie Henley, "Evolving Chinese Concepts of War Control and Escalation Management," in Michael Swaine et al., ed., *Assessing the Threat: The Chinese Military and Taiwan's Security* (Washington, DC: Carnegie Endowment for International Peace, 2007).