Trespass to Airspace: How to Deter North Korea from Its Space Ambitions?

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In deterring North Korea from pursuing its space ambitions, the neighbouring States may consider to advance a sovereignty argument that North Korea's overflying rockets have trespassed to their territorial airspace. The current UNSC Resolution-based arguments may not provide adequate deterrence because they are built upon a unilateral interpretation of the UNSC Resolutions and therefore lack legal persuasiveness. Currently, there is seemingly a strong international consensus favoring the demarcation line between airspace and outer space at approximately 100-120 kilometres above the sea level. As the North Korean rockets will likely overflow foreign territories when reaching to this altitude, a trespass claim should therefore have strong legal merits. Moreover, North Korea cannot raise a defence by claiming a right of innocent passage over foreign airspace, because such right does not exist as a customary international law. Even if such right exists, North Korea will be hard to rely on it because its overflying rockets are hardly 'innocent.'

Keywords
Satellite Launch, Air Sovereignty, NPT, Outer Space Treaty, Ballistic Missile, Right of Innocent Passage.

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I. Introduction

On December 12, 2012, the Democratic Peoples' Republic of Korea (hereinafter North Korea; "DPRK") stunned the world with its space ambitions by attempting to launch an 'Earth-observation' satellite.[1] Although the international community has repeatedly condemned North Korea prior to the launch for breaching the United Nations Security Council ("UNSC") Resolutions 1718[2] and 1874,[3] North Korea's determination still remained unaffected. As today's space technology can be easily converted to manufacture ballistic missiles, it is a matter of concern that North Korea's space activities would eventually become a threat to the world security in the future.

The primary objective of this research is to suggest a possible solution in effectively deterring North Korea from its growing space ambitions. This article consists of five parts including Introduction and Conclusion. Part two will present the overview of the present scenario by reviewing the history of North Korean space launches and the challenges that such activities can bring to the international security. Part three will examine the current international condemnations against North Korea for breaching the UNSC Resolutions 1718 and 1874. Here, the author will address that this UNSC argument cannot afford adequate deterrence to North Korea's ambitions. Part four will suggest that a more effective solution for North Korea's neighbouring countries is to advance a sovereignty argument that North Korea's satellite launching vehicles have trespassed to their territorial airspace. This part will also discuss a possible counter-argument of North Korea based on a "right of innocent passage" over foreign airspace for its space activates because North Korea is geographically disadvantaged from accessing the outer space without trespassing the territorial airspace of other countries.

1 Sang-Hun Choe & D. Sanger, *North Koreans Launch Rocket in Defiant Act*, N.Y. Times, Dec. 12, 2012, *available at* http://www.nytimes.com/2012/12/12/world/asia/north-korea-launches-rocket-defying-likely-sanctions.html (last visited on Mar. 2, 2013).

2 S.C. Res. 1718, U.N. Doc. S/RES/1718 (Oct. 14, 2006), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=S/RES/1718 (2006) (last visited on Mar. 2, 2013). For details, *see* Eric Yong Joong Lee, *Legal Analysis of the 2006 U.N. Security Council Resolutions against North Korea's WMD Development*, 31 Fordham J. Int'l L. 8-12 (2007).

3 S.C. Res. 1874, U.N. Doc. S/RES/1874 (Jun. 12, 2009). *See also* D. Joyner, *Introductory Note to the United Nations Security Council Resolution 1874*, 48:5 I.L.M. 1174-1175 (2009).

II. North Korea's Space Ambitions: An Overview

A. North Korea's Satellite Launches

To date, North Korea has made four attempts of launching satellites. Its first launch can be dated back to August 31, 1998 (hereinafter the 1998 launch),[4] which was observed to have been unsuccessful. At that time, the rocket was launched 'over' Japan[5] without prior notice or warnings in advance.[6] Although the launch was not successful, North Korea was severely criticized by the international community. In particular, the International Civil Aviation Organization ("ICAO") commented that the satellite launch was "done in a way not compatible with [the Chicago Convention]."[7] The International Maritime Organization ("IMO") also criticised[8] North Korea for violating an IMO Assembly Resolution which requires prior navigational warnings for space missions that might affect the safety of shipping.[9]

On April 5, 2009, North Korea made the second attempt to launch a satellite into the Earth orbit (hereinafter the 2009 launch), which was also reported to have failed.[10] This launch used an Unha-2 rocket, which was closely resembled to Taepodong 2 intercontinental ballistic missile ("ICBM")[11]– a long-range missile

4 G. Mitchell, *Japan-U.S. Missile Defense Collaboration: Rhetorically Delicious, Deceptively Dangerous*, 25 Fletcher F. World Aff. 87 (2001), *available at* http://www.pitt.edu/~gordonm/JPubs/JapanTMD.pdf (last visited on Mar. 17, 2013).

5 *See* J. Anselmo, *Missile Test Extends North Korea's Reach*, 56 Aviation Week & Space Technology (1998); P. Mann, *Missile Defense Boosted, Despite Weak Management*, 34 Aviation Week & Space Technology (1998).

6 K. Nakatani, *The Taepodong Missile Incident and Emerging Issues of Interpretation and Application of Space Treaties,* The 44th Colloquium on the Law of Outer Space Proc. 144 (2002), summary, *available at* http://www.iislweb.org/docs/2001%20IISL%20REPORT%20TOULOUSE.pdf (last visited on Mar. 2, 2013).

7 *See Safety of Navigation*, Resolutions adopted at the 32nd Session of the Assembly, ICAO Ass. Res. A32-6, *available at* http://legacy.icao.int/icao/en/assembl/a32/resolutions.pdf (last visited on Mar. 2, 2013).

8 IMO, Navigational Warning Concerning Operations Endangering the Safety of Navigation (1998), MSC/Circ. 893, *available at* http://www.imo.org/blast/blastDataHelper.asp?data_id=1813&filename=893.pdf (last visited on Mar. 2, 2013).

9 IMO/IHO World-Wide Navigational Warning Service Guidance Document, Annex 1, ¶¶ 4.2.1.3.13, 6.6.1.5, and 6.6.1.9. *See also* the *World-Wide Navigational Warning Service* (1991), IMO Assembly Res. A.706(17), *available at* http://www.imo.org/blast/blastDataHelper.asp?data_id=23156&filename=A706(17).pdf (last visited on Mar. 2, 2013).

10 *See North Korea Space launch "fails,"* BBC News, Apr. 5, 2009, *available at* http://news.bbc.co.uk/2/hi/7984254.stm (last visited on Mar. 2, 2013).

11 *See A Post-launch Examination of the Unha-2,* Bulletin of the Atomic Scientists, Jun. 29, 2009, *available at* http://www.thebulletin.org/web-edition/features/post-launch-examination-of-the-unha-2 (last visited on Mar. 2, 2013). For details on Taepodong missile, *see* Lee, *supra* note 2, at 2 (Figure 1-1).

capable of delivering a military payload to the United States.[12] Unsurprisingly, this launch also received severe international condemnations.

On March 16, 2012, North Korea announced that it would launch a "polar-orbiting Earth observation satellite" to commemorate the centennial birthday of the late premier Kim Il-sung (hereinafter the first 2012 launch).[13] This announcement immediately attracted international criticisms from various countries, including the United States,[14] Russia,[15] the United Kingdom,[16] Japan[17] and South Korea.[18] Furthermore, Japan,[19] South Korea[20] and Taiwan[21] warned that they would intercept the launch vehicle if it threatened their territory. China also expressed 'concerns' toward the launch.[22] Nevertheless, North Korea eventually carried out this launch on April 12, 2012, which was failed immediately.[23] The South Korea's Ministry of

12 S. Mikula, *Blue Helmets in the Next Frontier: The Future is Now*, 29 Ga. J. Int'l & Comp. L. 544 (n. 47) (2001).

13 Sang-Hun Choe & S. M. Lee, *North Korea Says It Will Launch Satellite Into Orbit*, N.Y. Times, Mar. 16, 2012, *available at* http://www.nytimes.com/2012/03/17/world/asia/north-korea-satellite-launch-missile-test.html (last visited on Mar. 2, 2013).

14 *See* US Dept. Of State Daily Press Briefing: DPRK Missile Launch, Apr. 9, 2012, *available at* http://www.state.gov/r/pa/prs/dpb/2012/04/187595.htm#DPRK (last visited on Mar. 2, 2013).

15 Staff Writer, *Russia Condemns North Korea's Planned Satellite Launch*, KyivPost, Apr. 10, 2012, *available at* http://www.kyivpost.com/content/russia-and-former-soviet-union/russia-condemns-north-koreas-planned-satellite-lau-125762.html (last visited on Mar. 2, 2013).

16 A. Willis, *US and Britain Condemn North Korean "Provocation,"* The Telegraph, Apr. 13, 2012, *available at* http://www.telegraph.co.uk/news/worldnews/asia/northkorea/9201660/US-and-Britain-condemn-North-Korean-provocation.html (last visited on Mar. 2, 2013).

17 *See North Korea Rocket Plan Condemned as "Provocation,"* BBC News, Mar. 16, 2012, *available at* http://www.bbc.co.uk/news/world-asia-17400146 (last visited on Mar. 2, 2013).

18 Staff Writer, *ROK Renews Condemnation of DPRK's Satellite Launch*, China Daily, Apr. 29, 2012, *available at* http://www.chinadaily.com.cn/world/2012-03/19/content_14864835.htm (last visited on Mar. 2, 2013).

19 Staff Writer, *Japan Ready for North Korea Missile Launch*, Alijazeera, Apr. 5, 2012, *available at* http://www.aljazeera.com/news/asia-pacific/2012/04/201245164632450178.html (last visited on Mar. 2, 2013).

20 Staff Writer, *South Korea Warns It May Shoot Down North Korean Rocket*, The Guardian, Mar. 26, 2012, *available at* http://www.guardian.co.uk/world/2012/mar/26/south-korea-shoot-down-north-korea-rocket (last visited on Mar. 2, 2013). Won-shik Yoon, a spokesman of South Korea's Defence Ministry stated that: "We are studying measures such as tracking and shooting down [parts] of a North Korean missile in case they stray out of their normal trajectory and violate South Korean territory." *See 'Watch Condition' raised from level-3 to level-2 due to ROK-US's Monitor of DPRK ... DPRK's launch of Kwangmyongsong-3 is Imminent* (한미대북감시태세 "워치콘" 3단계서 2단계로격상…북 "광명성 3호" 발사임박), Kookmin Daily, Apr. 11, 2012, *available at* http://news.kukinews.com/article/view.asp?page=1&gCode=kmi&arcid=0005986987&cp=nv (last visited on Mar. 2, 2013) .

21 Hyeon-Jin Ju, *Taiwan deployed anti-air missiles, will intercept Kwangmyongsong when invading airspace* ("광명성 영공 침범땐 요격" 타이완, 방공 미사일배치), Seoul News, Apr. 3, 2012, *available at* http://www.seoul.co.kr/news/newsView.php?id=20120403008021 (last visited on Mar. 2, 2013).

22 K. Takahashi, *Rocket Reaction Follows Familiar Trajectory*, Asia Times, Apr. 12, 2012, *available at* http://www.atimes.com/atimes/Korea/ND12Dg01.html (last visited on Mar. 2, 2013).

23 Sang-Hun Choe & R. Gladstone, *North Korean Rocket Fails Moments After Liftoff*, N.Y. Times, Apr. 12, 2012, *available at* http://www.nytimes.com/2012/04/13/world/asia/north-korea-launches-rocket-defying-world-warnings.html (last visited on Mar. 2, 2013).

National Defense reported that the rocket reached to an altitude of 151 kilometres[24] above the Baekryeong-do island[25] on the northern Yellow Sea before it exploded. Its debris fell into the ocean at a distance of 100 to 150 kilometres off the western coast[26] of South Korea and the first stage of the rocket fell into the sea at about 166 kilometers west of Seoul.[27]

On December 12, 2012, North Korea attempted another launch of a 'scientific satellite,' Kwangmyongsong-3, by using an Unha-3 rocket (hereinafter the second 2012 launch).[28] The satellite was seemingly placed in orbit successfully,[29] although it was suspected to be not fully functional.[30] As a result, this launch has attracted yet another wave of international criticisms,[31] including the UNSC Resolution 2087, which "express[ed] [the UNSC's] determination to take significant action in the event of a further DPRK launch."[32] The whole venture of North Korea's space ambition can be projected in the following Table.

24 Sangwon Yoon, *South Korea Stops Search for North's Rocket Debris,* Bloomberg, Apr. 17, 2012, *available at* http://www.bloomberg.com/news/2012-04-17/s-korea-stops-search-for-north-s-rocket-debris-after-un-censure.html (last visited on Mar. 2, 2013).

25 *N. Korea's Long-range Rocket Crashes Shortly after Takeoff*, Yonhap News, Apr. 13, 2012, *available at* http://english.yonhapnews.co.kr/national/2012/04/13/56/0301000000AEN20120413001257315F.HTML (last visited on Mar. 2, 2013).

26 *Supra* note 24.

27 *Supra* note 23.

28 *See* North Korean rocket launch condemned, RT Question More, Dec. 12, 2012, *available at* http://rt.com/news/north-korea-launches-missile-865 (last visited on Mar. 8, 2013).

29 Duyeon Kim, *North Korea's Successful Rocket Launch*, The Centre for Arms Control and Non-Proliferation, *available at* http://armscontrolcenter.org/issues/northkorea/articles/north_koreas_successful_rocket_launch/# (last visited on Mar. 2, 2013).

30 Staff Writer, *South Korea Says North Korea Rocket Appears to be Orbiting Earth*, Fox News, Dec. 13, 2012, *available at* http://www.foxnews.com/world/2012/12/13/south-korea-says-north-korea-rocket-appears-to-be-orbiting-earth-as-north/#ixzz2MBKZud19 (last visited on Mar. 2, 2013).

31 *Supra* note 28.

32 S.C. Res. 2087, U.N. Doc. S/RES/2087, at ¶ 19 (Jan. 22, 2013), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=S/RES/2087%282013%29 (last visited on May 6, 2013).

Table II-1: North Korea's Satellite-Launching Attempts

Date	Launch Station	Name of Rocket	Name of Satellite	Result	International Response
Aug. 31, 1998	Musudan-ri	Paektusan	Kwangmyongsong-1	Failed	ICAO and IMO condemned the launch.
Apr. 5, 2009	Musudan-ri	Unha-2	Kwangmyongsong-2	Failed	UNSC passed Resolution 1874.
Apr. 12, 2012	Tongchang-ri	Unha-3	Kwangmyongsong-3	Failed	International criticisms were attracted.
Dec. 12, 2012	Tongchang-ri	Unha-3	Kwangmyongsong-3	Satellite placed in orbit; satellite may not be functional	UNSC passed Resolution 2087.

Source: Compiled by the author.

B. International Concern

Because space technology is similar to ballistic missile technology,[33] satellite launch vehicles can easily be converted to ICBMs if the satellite payloads is replaced with war payloads.[34] Alternatively, such technologies can at least efficiently assist the ICBMs to be built.[35] Considering that North Korea has withdrawn from the Treaty on Non-proliferation of Nuclear Weapons ("NPT") on January 10, 2003,[36] the war payloads to be delivered by an ICBM can be thermonuclear warheads, biological weapons or other types of weapons of mass destruction.

Japan advocated, in a Security Council proceeding, that: "The combination of ballistic missile capability and, now, the claim of nuclear capability in the hands of a regime known for reckless irresponsible behaviour, created nothing less than a grave threat to peace and security."[37] Considering the current situation, North Korea's space ambitions must be a grave concern for the global peace and security and thus such activities should be effectively discouraged and deterred by the international

33 K. Bommakanti, *Indian Space Launch Vehicles and ICBM*, The Center for Defense Information Website (Feb. 29, 2008), *available at* http://www.pdfio.com/k-1002100.html (last visited on Mar. 2, 2013).

34 *Id.*

35 *Id.*

36 J. Price, *Pyongyang leaves a popular treaty*, WASH.TIMES, NOV. 1, 2003, at A 06.

37 S.C. Res. 8853, U.N. Doc. S/RES/8853(Oct. 14, 2006), *available at* http://www.un.org/News/Press/docs/2006/sc8853.doc.htm (last visited on Mar. 2, 2013).

community.

III. UNSC Resolutions regarding North Korea's Satellite Launch

A. Debates in the Security Council

North Korea's 2012 satellite launches received heavy international criticisms based on mainly the UNSC Resolutions 1718 and 1874, which prohibited North Korea from using ballistic missile technologies.

Resolution 1874, passed on June 12, 2009[38] in response to a nuclear test conducted by North Korea, demanded the DPRK "not [to] conduct any further nuclear test or any launch using ballistic missile technology,"[39] and urged to "suspend all activities related to its ballistic missile programme and in this context re-establish its pre-existing commitments to a moratorium on missile launches."[40] An earlier document, Resolution 1718 similarly demanded that "the DPRK [should] not conduct any further nuclear test or launch of a ballistic missile."[41]

In connection to the resolutions, the United States also blamed the launch as a "violation of UN Security Council resolution 1718 and 1874."[42] The US Department of States spokesman mentioned that: "North Korea cannot conduct the launch even if it is for a satellite for peaceful purposes, because the launch cannot be completed without using ballistic missile technology banned by the Resolution 1874."[43]

However, North Korea counter-argued that the international condemnations are based on 'double standards.'[44] The grounds of its counter-argument were as follows. First, the Treaty on Principles Governing the Activities of State in the Exploration and Use of Outer Space[45] (hereinafter the Outer Space Treaty), which is "above a UN

38 S.C. Res. 1874, U.N. Doc. S/RES/1874 (Jun. 12, 2009), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=S/RES/1874(2009) (last visited on Mar. 2, 2013).

39 *Id.* at ¶ 2.

40 *Id.* at ¶ 3.

41 *Supra* note 2, at ¶ 2.

42 *Supra* note 14.

43 *Id.*

44 *See U.S. Should Not Apply Double Standards to DPRK's Satellite Launch: FM Spokesman*, Korea News Service in Tokyo, Mar. 27, 2012, *available at* http://www.kcna.co.jp/item/2012/201203/news27/20120327-20ee.html (last visited on Mar. 2, 2013).

45 Treaty on Principles governing the Activities of State in the Exploration and Use of Outer Space, including the Moon

resolution,"[46] has provided that every country is "independent in space development and has sovereign rights in the matter."[47] Second, the UNSC Resolutions have not definitely forbidden North Korea from "launching a satellite using a launch vehicle."[48] Finally, North Korea has declared that it would "never give up the launch of a satellite for peaceful purposes."[49]

Despite North Korea's strong protests, the UNSC released a presidential statement which condemned North Korea for its satellite launch violating the UNSC resolution 1718,[50] and demanded not to proceed with any further launches using ballistic missile technology.[51]

B. Evaluation

Although the UNSC Resolution-based condemnation may have a standing in a legal sense, the argument is largely reliant on a unilateral interpretation of the Resolutions.

First, the texts of the concerned UNSC Resolutions are vaguely worded; they can be interpreted in different ways. In particular, Resolution 1874 has merely banned North Korea from conducting "any launch using ballistic missile technology." However, what constitutes such banned technology remained unclear from the text. Although ballistic missile technology is very similar to satellite technology,[52] they are not exactly the same. For example, ballistic missiles and satellites are propelled by different fuel; the former uses 'solid' fuel, whereas the latter uses 'liquid' fuel.[53] Such ambiguity based on the principle of freedom of outer space enshrined in the Outer

and Other Celestial Bodies, Oct. 10, 1967, *available at* http://www.unoosa.org/pdf/publications/st_space_61E.pdf (last visited on May 1, 2013).

46 *Supra* note 14.

47 *Id.*

48 *Id.*

49 Choe Sang-Hun, *North Korea Reaffirms Plan to Launch Satellite*, N.Y. Times, Mar. 27, 2012, *available at* http://www.nytimes.com/2012/03/28/world/asia/north-korea-reaffirms-plan-to-launch-satellite.html (last visited on Mar. 2, 2013)

50 *See* Security Council 6752nd meeting agenda, U.N. Doc S/PV.6752 (Apr. 16, 2012), *available at* http://www.un.org/ga/search/view_doc.asp?symbol=S/PV.6752 (last visited on May. 6, 2013).

51 *Id.*

52 D. Anderson, *A Military Look into Space: The Ultimate High Ground*, The Army Law 22 (Nov. 1995), *available at* http://www.loc.gov/rr/frd/Military_Law/pdf/11-1995.pdf (last visited on May 2, 2013).

53 This view is shared by some Indian scholars, *see e.g. supra* note 33 (discussing the technical barriers for India to transform its satellite launching vehicles into ballistic missiles). Kum-Chol Ryu (North Korean deputy director of the space development department) has acknowledged this difference, *see North Korea says All Preparations done for Satellite Launch*, The Associated Press, Apr. 10, 2012, *available at* http://www.cbc.ca/m/touch/news/story/2012/04/10/north-korea-missile-test.html (last visited on Mar. 2, 2013).

Space Treaty,[54] however, may produce an interpretation of the Resolution 1874 in favor of North Korea.

Resolution 1718 is even more controversial. It has merely banned North Korea from conducting "any further … launch of a ballistic missile"[55] without even mentioning space activities. Under the principle of *expressio unius est exclusio alterius* (expression of the one is the exclusion of the other), an interpretation in favor of North Korea can also be returned. In this light, North Korea's counter-arguments would have fairly strong legal merits.

Nevertheless, it should be recognized that the power of issuing authoritative interpretations of the UNSC Resolutions resides with the Council itself considering that "the right of giving an authoritative interpretation of a legal rule belongs solely to the person or body who has power to modify or suppress it."[56] Given that the UNSC has 'ratified' the aforementioned unilateral interpretation with a presidential statement which repeated the international condemnations, such interpretation would carry legal power; nonetheless, as stated above, the legal persuasiveness of such interpretation is highly debatable.

In addition, Resolutions 1874 and 1718 may have other limitations. First, the UNSC Resolutions, unlike international treaties, used to be drafted to deal with specific matters for a short-term period.[57] Once the Resolutions are no longer in force, these arguments will accordingly fail. Second, as these Resolutions are only concerned with North Korea, they cannot deter other "States of concern" (*e.g.* Iran or Syria) from pursing their space ambitions. Consequently, although the UNSC Resolutions have seemingly made North Korea's satellite launches unlawful at this instance, they shall not be considered as an ultimate answer to this problem.

IV. Trespass to Sovereign Airspace

A. The Alternative Argument

In deterring North Korea's satellite launch, its neighbouring countries may advance

54 Outer Space Treaty art. 1.

55 *Supra* note 38.

56 M. Wood, *The Interpretation of Security Council Resolutions*, *in* 2 Max Blanck Yearbook of United Nations Law 83 (1998) (quoting Jaworzia Advisory Opinion, 1923 P.C.I.J. (ser. B) No.8, at 37), *available at* http://www.mpil.de/shared/data/pdf/pdfmpunyb/wood_2.pdf (last visited on May 6, 2013).

57 *Id.* at 82.

a trespass to sovereign airspace claim, instead of solely relying on the UNSC approach. As a satellite launching vehicle will first move through the airspace of neighbouring countries before reaching outer space,[58] these States may rightly argue that North Korea's launching vehicles has trespassed to their territorial airspace infringing their sovereignty.

Previously, this argument has been used by other States in various occasions. For instance, South Korea condemned North Korea for "invasion of Japanese air space" after North Korea's 1998 launch.[59] Similarly for the 2009 launch,[60] South Korea and Japan warned that they would intercept the rocket if it flew 'over' their territory. As North Korea always attaches great importance to its independence and sovereignty, it should also respect other State's sovereignty interests.

North Korea has not yet raised any valid defense against foreign trespass claims. Instead, it has constructed a new launching site at its northwest corner named Tongchang-dong Missile and Space Launch Facility (or the Sohae Satellite Launching Station)[61] and changed the expected trajectory of the first 2012 launch from a path to the east which would pass over Japan[62] (which was adopted in its 1998 and 2009 launches) to a southerly trajectory over the Yellow Sea just west of South Korea, then to the east of the Philippines.[63]

This alteration is quite noticeable. To launch a satellite into orbit, the launching vehicles should be moved eastward so as to take advantage of the velocity of the Earth's rotation.[64] Otherwise, the vehicle should be more powerful and accurate (and therefore more costly)[65] to gain speed than those launching in the east.[66] Considering

58 D. Reinhardt, *The Vertical Limit of State Sovereignty*, 72 J. Air L. & Comm. 65 & 100 (2007), *quoting* J. Johnson, *Freedom and Control in Outer Space*, *in* The Conference On Space Science And Space Law Proc. 138 & 140 (M. Schwartz ed., 1964).

59 *Id*. at 106.

60 *Supra* note 22.

61 G. Thielmann, Long-Range Ballistic Missile: A Tale of Two Tests, The Arms Control Association, ACM, *available at* http://www.armscontrol.org/threats/Long-Range-Ballistic-Missile-Development-A-Tale-of-Two-Test (last visited on Mar. 2, 2013).

62 K. Tate, North Korea's Unha-3 Rocket Launch Explained, Space.com, *available at* http://www.space.com/15006-north-korea-unha-3-rocket-launch-infographic.html (last visited on Mar. 2, 2013).

63 *See* North Korea Long-Range Rocket Launch Fails: Reports, Space.com, *available at* http://www.space.com/15258-north-korea-rocket-launch-fails.html (last visited on Mar. 2, 2013).

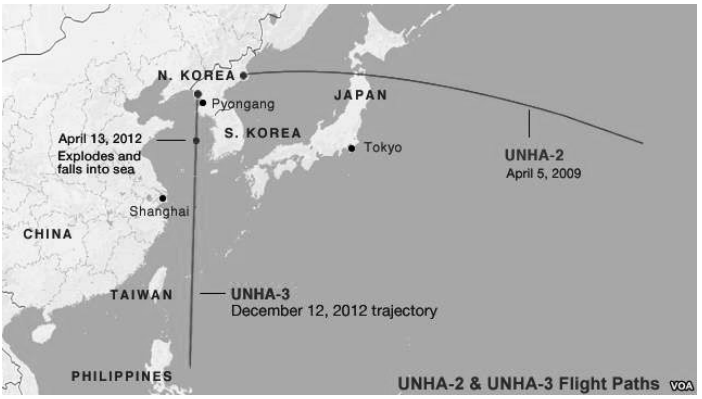
64 D. Wright et al., The Physics of Space Security 24 (2005), *available at* http://www.ucsusa.org/assets/documents/nwgs/physics-space-security.pdf (last visited on Mar. 2, 2013). *See also* L. Perek, *Scientific Criteria for the Delimitation of Outer Space*, 5 J. Space L. 121 (1977).

65 D. Wright, A Comparison of North Korea's Unha-2 and Unha-3, Union of Concerned Scientists (Apr. 8, 2012), Union of Corncernd Scientists, *available at* http://allthingsnuclear.org/a-comparison-of-north-koreas-unha-2-and-unha-3 (last visited on Mar. 2, 2013).

66 *Supra* note 58, at 104.

that North Korea is not in a highly advanced stage of space technology, the modified trajectory must raise the costs for its rocket and reduce its prospect of a successful launch. This means that North Korea has supposedly compromised with Japan's sovereignty interests. Even North Korea has explicitly explained that it has modified trajectory in order to "avoid other countries."[67] In the view of the above, a claim of trespass to airspace should effectively deter North Korea's space activities.

Figure 1: Comparison of North Korea's Westward and Southward Trajectories[68]



B. Delimitation of Outer Space

The main difficulty of the above argument, however, is that the vertical limit of State sovereignty is still under dispute. Under contemporary international law, airspace is subject to "complete and exclusive sovereignty"[69] of nations, whereas outer space "is not subject to national appropriation by claim of sovereignty."[70] A question may arise on the delimitation between these two areas.[71]

There were four positions addressed on this issue. First, the physical point theory provides that the demarcation line should be drawn at the 'physical point'

67 Staff Writer, *supra* note 20. It reports that "North Korea calls the launch part of its peaceful space programme and says a new southerly flight path is meant to avoid other countries."

68 Youmi Kim, *Defiant North Korea Carries Out "Space Launch,"* Voice of America, Dec.11, 2012, *available at* http://www.voanews.com/content/north-korea-launches-long-range-rocket-despite-criticism/1563138.html (last visited on Mar. 2, 2013).

69 *See* Convention on International Civil Aviation art. 1, signed on Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295. *See also supra* note 8, at 76.

70 *Supra* note 45, art. 2.

71 W. Heere, *Problems of Jurisdiction in Air and Outer Space*, 24 Air & Space L. 78 (1990).

where space begins.[72] Second, the Karman line theory sets the demarcation line at the highest altitude at which an aircraft is capable of flying, or at the lowest altitude for a space object to orbit the Earth.[73] Third, the Lower Demarcation line theory draws the line at much lower latitude, *e.g.*, 12 nautical miles[74] or 55 miles.[75] Fourth, Functionalism maintained that space and air activities should be governed according to their nature, i.e., aeronautical activities by air law and space activities by space law.[76] Therefore, an arbitrary line is both artificial and unnecessary.[77] It is impractical, however, to arbitrarily classify a space shuttle as either a spacecraft or an aircraft.[78]

The international community has reached to a general consensus that the demarcation line should be drawn at around 100-120 kilometres above the sea level. This consensus is not only the compromise of the abovementioned demarcation theories, but also is endorsed by space superpowers. In 1979, *e.g.*, the former Soviet Union proposed that outer space begin at 100 to 110 kilometres above sea level.[79] Further in 2008, Russia and China submitted another treaty proposal to the Conference on Disarmament[80] which suggested that: "The term 'outer space' means the space above the Earth in excess of 100 km above sea level."[81] This proposal as reported by the conference coordinator was welcomed by 'many delegations.'[82] No countries have seemingly challenged foreign sovereignty claims to the airspace below 100-120 kilometres so far. In considering the above deliberations, North Korea's neighbouring countries have strong legal merits on international law should

72 *Supra* note 58, at 113 (n. 297).

73 *Supra* note 66. *See also supra* note 58, at 114.

74 *Supra* note 58, at 126.

75 J. Thomas, *Spatialis Liberum*, 8 Fla. Coastal L. Rev. 579 (2006)

76 C. Petras, *"Space Force Alpha": Military Use of the International Space Station and the Concept of "Peaceful Purposes,"* 53 A.F. L. Rev. 155 (2002).

77 S. Hosenball & J. Hofgard, *Delimitation of Air Space And Outer Space: Is A Boundary Needed Now?*, 57 Uni. Col. L. Rev. 887 (1985).

78 A. Harris & R. Harris, *The Need for Air Space and Outer Space Demarcation*, 22 Space Pol'y 6 (2006).

79 *See* Draft Basic Provisions of the General Assembly Resolution on the Delineation of Air Space and Outer Space and on the Legal Status of the Geostationary Satellites Orbital Space (1979), UNCOPUOS, U.N. Doc. A/AC.105/L.112.

80 *See* Letter from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament (Feb. 12, 2008), Addressed to the Secretary-General of the Conference Transmitting the Russian and Chinese Texts of the Draft Treaty on Prevention of the Placement of Weapons in Outer space and the Treat or Use of Force Against Outer space Weapons ("PPWT") introduced by the Russian Federation and China, Conference on Disarmament, CD/1839 (2008); Letter from the Permanent Representative of China to the Conference on Disarmament (Feb. 12, 2008), Addressed to the Secretary-General of the Conference Transmitting A message from the Minister for Foreign Affairs of China to the Conference on Disarmament, Conference on Disarmament, CD/1836 (2008).

81 *Id*. art 1(a).

82 M. Grinius, Report on the 2008 Informal Meetings of the Conference on Disarmament on agenda item 3 "Prevention of an Arms Race in Outer Space*"* ("PAROS") (2008) [CD/1846, at 18-19].

they claim sovereignty over the area below 100-120 kilometres above the sea level.

C. North Korea's Trespass

Considering the North Korea's geological location and size, it would be almost impossible to choose the launch azimuths without trespassing 'over' the neighbouring countries.[83] A trespass claim should be thus effective in providing adequate deterrence.[84] Even if North Korea alters its launching trajectory to the south to avoid Japan's territorial air space, the rocket will nonetheless trespass to South Korea's territorial air space as shown in the first 2012 launch.

Figure 2: North Korea's first 2012 launch[85]

83 *Supra* note 58, at 113 (n. 297).

84 There is a long standing dispute regarding maritime delimitation in the northern Yellow Sea between North and South Korea along the Northern Limit Line ("NLL"). For details, *see* J. Dyke et al., *The North/South Korea Boundary Dispute in the Yellow (West) Sea*, 27 Marine Pol'y, 143 (2003).

85 Sang-Ho Yun, *North Korean Rocket from Tongchang-ri ... "Looks will Pass Territorial Airspace over Baekryeong-do"* (北로켓 동창리로… "백령도 영공 지날듯), Dong-A Daily, Mar. 26, 2012 *available at* http://news.donga.com/Politics/viewlist/3/00/20120326/45039799/1 (last visited on Mar. 2, 2013).

South Korea's Ministry of National Defence reported that the North Korean rocket of the first 2012 launch exploded at an altitude of 151 kilometres above the Baekryeong-do (island) and its debris then fell into the ocean at a distance 100 to 150 kilometres off the western South Korean coast.[86] A State's territorial sovereignty will include the air space above the territorial sea.[87] Because South Korea claims 12-mile's territorial sea,[88] North Korea's rocket was very likely to have flown above South Korea's territorial sea north to Baekryeong-do before achieving the altitude of 100-120 kilometres. This view is shared by some scholars, who observed that the North Korean rocket trajectory 'looks like' to have "overflown Baekryeong-do under 100 kilometers within two minutes after it was launched," and thus have "penetrated into the South Korean territorial airspace above Baekryeong-do."[89]

On the other hand, North Korea may argue that the trajectory for a space object to take-off is usually very steep.[90] If scientifically calculated, the distance between the Sohae Launching Station and the Baekryeong-do is only 210.7 kilometres. Then, North Korea's Unha-3 rocket (which used in the first 2012 launch) should have vertically travelled when achieving the altitude of 100-120 kilometres[91] from the launching site in order not to trespass South Korea's airspace.[92] [Emphasis added]

As a consequence, North Korea's neighbouring countries may argue that the North Korean launching activities would trespass to their territorial airspace. If so, the 'trespass claim' would be demonstrate its persuasiveness in deterring North Korea's satellite launch. In particular, it can (a) refute the moral high ground advocated by North Korea; (b) continue to stand after the UNSC Resolutions concerned are repealed in the future; and (c) deter other "States of concern"[93] with small territories (probably Syria) from pursuing similar space ambitions.

86 *Supra* note 25.

87 *Supra* note 58, at 79.

88 Territorial Sea and Contiguous Zone Act of 1995 (Law No. 3037) art. 1.

89 *Supra* note 85. *See also* Jong-Hun Ha, *North Korean "Kwangmyongsong-3" would presumably Pass Territorial Airspace over Baekryeong-do* (北 "광명성 3호" 백령도 영공 지날 듯), Seoul Daily, Mar. 27, 2012, *available at* http://www.seoul.co.kr/news/newsView.php?id=20120327006012&spage=19 (last visited on Mar. 2, 2013).

90 *See* Questionnaire on Possible Legal Issues with Regard to Aerospace Objects: Replies from Member States (hereinafter Questionnaire addendum) (May 7, 2003), U.N. Doc. A/AC.105/635/Add.9, *available at* http://www.oosa.unvienna.org/pdf/reports/ac105/AC105_635Add9E.pdf (last visited on Mar. 2, 2013).

91 *Supra* note 65.

92 *Supra* note 58, at 105.

93 *E.g*, the Islamic Republic of Iran successfully launched a communication satellite in early 2009. *See* R. Spencer, *State Supervision of Space Activity*, 63 A.F. L. Rev. 75 (2009).

V. Right of Innocent Passage

A. Issue

In response to the airspace sovereignty of neighboring countries, North Korea could advance a counter-argument based on the "right of innocent passage" over foreign airspace under international law. The following section will analyze this critical legal question by examining the relevant doctrine, State practices, and customary international law.

B. The Doctrine

Article 1 of the Outer Space Treaty provides that: "Outer space […] shall be free for exploration and use by all States without discrimination of any kind [and] on a basis of equality."[94] Also, the freedom of using outer space includes free access to outer space.[95] Although outer space is free,[96] few States will be able to put a satellite into orbit without passing through the national airspace of other States.[97] If the right of innocent passage is denied, the 'space locked' States would be precluded from having free access to space.[98] In this case, only a limited number of States in the privileged position can profit from the freedom of outer space. Therefore, the right of innocent passage has to be granted to ensure that outer space can be freely accessed by every nation on an equal basis.[99]

McDougal prefers an alternative approach by relying on a law of the sea analogy.[100] Since the sea is open to every nation in the international community, the freedom of navigation of high seas may also be enjoyed by land-locked States.[101]

94 *Supra* note 45.

95 Marietta Benkö et al., Space law in the United Nations 135 (1985).

96 *Supra* note 45. *See also* D. Tan, *Towards a New Regime for the Protection of Outer Space as the "Province of All Mankind,"* 25 Yale J. Int'l L. 146-148 (2000).

97 J. Cooper, *Legal Problems of Spacecraft in Airspace*, *in* Explorations in Aerospace Law: Selected Essays by John Cobb Cooper 311 (I. Vlasic ed., 1968).

98 F. von der Dunk, *The Delimitation of Outer Space Revisited - The Role of National Space Laws in the Delimitation Issue* 261 (1998), 51 Space and Telecommunications Law Program Faculty Publications, *available at* http://digitalcommons.unl.edu/spacelaw/51 (last visited on Mar. 2, 2013).

99 Outer Space Treaty art. 1. It states that: "Outer space […] shall be free for exploration and use by all States […] on a basis of equality".) *See also* I. Diederiks -Verschoor, An Introduction to Space Law 73 (2008).

100 M. McDougal, *The Emerging Customary Law of Space*, Faculty Scholarship Series 619 (1963), *available at* http://digitalcommons.law.yale.edu/fss_papers/2609 (last visited on Mar. 2, 2013).

101 P. Malanczuk, Akehurst's Modern Introduction to International Law 177 (1997). *See also* Xue Hanqin,

Therefore, the States lying between the land-locked States and the sea should permit the land-locked States to transit through their territory.[102] Like the ships of all States which "enjoy the right of innocent passage through the territorial sea,"[103] the same logic should be similarly applied to outer space.[104] Considering that outer space should be free for exploration and used by all States following the Outer Space Treaty,[105] space objects should also have the right of innocent passage when passing over foreign territorial airspace under international customary law.[106]

C. State Practice

The UN General Assembly issued a "Questionnaire on Possible Legal Issues with Regard to Aerospace Objects"[107] to its member States on January 15, 1996 (hereinafter the 1996 Questionnaire). Question 7 of this document queried that: "Are there precedents with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere and does international customary law exist with respect to such passage?"[108] Greece responded that: "Re-entries into Earth's atmosphere of all United States Space Shuttles, which were successively flown above the national airspace of many third States, may be considered as precedents of a kind of innocent passage," thus "an international customary law right was then created with respect to such passage, as it happened earlier in the case of the first artificial Earth satellite."[109] The Czech Republic also suggested that "an explicit admission of the right of [innocent] passage for space objects …should be considered as a way for legalization."[110]

Some other States including Kazakhstan, Mexico, Pakistan and Turkey replied positively that there are precedents with respect to the passage of aerospace objects into the Earth's atmosphere.[111] Specifically, it was found that, in 1988, the former Soviet space shuttle 'Buran' passed through Turkey's airspace during its re-entry

Transboundary Damage in International Law 196 (2003).

102 United Nations Convention on the Law of the Sea ("UNCLOS") art. 125(1) & (3). *See* U.N. Doc. A/CONF.62/122/Add.1. For details, *see* A. Sinjela, Land-locked States and the UNCLOS Regime (1983).

103 UNCLOS art. 17. The right of innocent passage was reaffirmed by the General Assembly of the United Nations in 1991. *See* G.A. Res. 46/212, U.N. Doc. A/RES/46/212 (Dec. 20, 1991).

104 *Supra* note 75.

105 *Supra* note 45.

106 *Id.*

107 *Supra* note 90.

108 *Id.*

109 Questionnaire addendum, Add.3, at 10.

110 *Supra* note 90.

111 *See generally* Questionnaire addendum, Add. 1-13.

phase without prior consent of the Turkish authorities.[112] Also in 1990, the American space shuttle Atlantis passed through the former Soviet airspace.[113] Contrastingly, there are no formal protests by States against such passages.[114] South Korea, *e.g.*, acknowledged that "most of the countries did not raise any objection to the passage of space objects over their airspace."[115] Likewise, the Czech Republic stated that: "No protests against [such passage] have been raised so far."[116]

Finally, the right of innocent passage can also be found in national legislations as well as in some bilateral agreements. Provisions on the right of innocent passage are granted by several States' domestic laws including Australia, Kazakhstan and Russia. The Russia Federation Law on Space Activities of 1993, *e.g.*, provides that: "A space object belonging to a foreign State may execute a single innocent [passage] through the airspace of Russia Federation."[117] The right of innocent passage is also provided by bilateral agreements concerns such as the Agreement on the Main Principles and Conditions for Utilization of the Baikonur Launch Site, signed between the Russian Federation and the Republic of Kazakhstan in 1994.[118]

D. Customary International Law

Two elements must be satisfied in ascertaining the existence of a rule of customary international law, namely, State practice and *opinio juris*.[119] State practice must be "extensive and virtually uniform in the sense of the provision invoked,"[120] whereas *opinio juris* denotes "a psychological factor [for a State to believe] that it was under a legal obligation to act that way."[121] As such, the two elements required to establish customary international law are rather difficult to satisfy.

112 *See* Analytical summary of the replies to the questionnaire on possible legal issues with regard to aerospace objects (2004), U.N. Doc. A/AC.105/C.2/L.249/Add.14.

113 Questionnaire addendum, Add.1, at 7. *See also* Marco Pedrazzi, Elements of International Space Law 277 (2006).

114 C. Christol, "*Innocent Passage" in the International Law of Outer Space*, 7 A.F. L. Rev 22 (1965), *reprinted in* C. Christol, Space law: Past, Present, and Future (1991).

115 Questionnaire addendum, Add. 3, at 6.

116 *Id.*

117 Russian Federation Law on Space Activities (1993) art 19(4). *See also* Comprehensive analysis of the replies to the questionnaire on possible legal issues with regard to aerospace objects, U.N. Doc A/AC.105/C.2/L.204 (Apr. 14, 1997); Analytical summary of the replies to the questionnaire on possible legal issues with regard to aerospace objects, U.N. Doc A/AC.105/C.2/L.249/Add. 2 (Feb. 9, 2007).

118 Questionnaire addendum, Add. 3, at 8.

119 M. Shaw, International law 68 (5th ed. 2003). *See also* Continental Shelf case (Libya v. Malta), Judgment, 1985 I.C.J. 13 (Jun. 3).

120 Shaw, *supra* note 119, at. 73. *See also* J. Henckaerts et al., Customary International Humanitarian Law 292 (2005).

121 Shaw, *supra* note 119, at. 73.

Unfortunately, the current State practice for the right of innocent passage in airspace is neither 'extensive,' nor 'uniform'[122] enough to establish a customary international law. First, not a few nations[123] have expressly denied the right of innocent passage of space objects before the United Nations in their reply to the 1996 questionnaire.[124] Such countries as Brazil,[125] Germany,[126] India,[127] South Africa,[128] South Korea,[129] the Netherlands,[130] Turkey[131] and Ukraine[132] have clearly shown in their submissions that the international law on innocent passage of foreign airspace does not exist.[133] Russia has submitted that such laws are "currently in the process of being elaborated."[134] South Korea further argued that most of the countries did not raise any objection to the passage of space objects mainly because they simply did not have any information about the passage and no special disadvantage was reported in relation to the passage.[135] The ICAO, as also submitted to the United Nations Committee on the Peaceful Uses of Outer Space in 1986, mentioned that the right of innocent passage was a proposal that did not reflect existing law.[136]

In the academic world, the existence of the right of innocent passage is also challenged by many commentators.[137] Reinhardt argued that the practical dangers to the neighbouring State are too profound,[138] and safety measures will have to be taken by any neighbouring State potentially affected, including evacuation of certain areas, or arrangements to clear the flight path below the space object from

122 *Id.*

123 E. Kelly, The Space Plane: the Catalyst for Resolution of the Boundary and "Space Object" Issues in the Law of Outer Space? 41(1998) (unpublished LL.M. thesis, McGill University).

124 *Supra* note 111.

125 Questionnaire addendum, Add.10.

126 *Supra* note 90.

127 Questionnaire addendum, Add.4

128 *Id*. Add.7

129 *Id*. Add.1.

130 *Id*. Add.7.

131 *Id*. Add.6.

132 *Id*. Add.16.

133 *Id*. Add.11.

134 *Id*. Add.1.

135 *Id.*

136 R. Jakhu, *International Law Governing the Acquisition and Dissemination of Satellite Imagery,* 29 J. Space L. 77 (2003)

137 Bin Cheng submitted that: "It would be wrong to conclude that a legal right of innocent passage has already risen in favor of space object." *See* B. Cheng, *The 1968 Astronauts Agreements or How Not to Make Treaty*, 27 Y.B. World Aff. 205-206 (1973).

138 *Supra* note 59, at 117.

international aviation.[139] Terril also observed that many States are reluctant to give up the possibility of using their geographic location to gain economic benefits by demanding fees for overflight rights.[140]

Eventually, it is clear that the existing State practice is far from adequate to establish an international customary law on the right of innocent passage over foreign airspace.

E. How to Establish 'Innocence'?

The "right of innocent passage" of space objects can only be granted when: (a) such space objects are engaged in a space activity which is considered lawful; and (b) its 'innocence' has been evidenced.[141] If the definition of innocent passage in the high seas is adopted in interpreting the requirement of 'innocence' of space objects, then a passage can only be innocent if "it is not prejudicial to the peace, good order, or security of the costal State."[142]

It is almost impossible for North Korea to satisfy this requirement by arguing that its overflying launching vehicles, which were in fact a cluster of military ballistic missiles, are fully 'innocent' in the sense that they are not "prejudicial to the peace, good order, or security" of Japan or South Korea. Thus, even if such right does exist, it will be highly unlikely for North Korea to rely on the right of innocent passage in justifying its space activities.

VI. Conclusion

In this paper, the author has endeavored to suggest a possible solution in effectively deterring North Korea's growing space ambitions. In particular, it has firstly overviewed the present issue by reviewing the history of North Korean space launches and the challenges that such activities can bring to the international security. This paper then examined the current international condemnations against North Korea for breaching the UNSC Resolutions 1718 and 1874; it submitted

139 *Id*. at 106.

140 D. Terrill Jr., The Air Force Role in Developing International Outer Space Law 27 (1999), *available at* http://www.maxwell.af.mil/au/aul/aupress/Books/Terrill/terrill.pdf (last visited on Mar. 2, 2013).

141 I. Diederiks-Verschoor, *Legal Aspects of Environmental Protection in Outer Space Regarding Debris*, *in* The 26th on Colloquium on the Law of Outer Space Proc. 20 (1987).

142 Convention on the High Seas of 1958 art. 14; UNCLOS art. 19.

that this UNSC argument cannot afford adequate deterrence to the present issue. Subsequently, the author has argued that a more effective solution is for North Korea's neighbouring countries to advance a sovereignty argument that North Korea's satellite launching vehicles have trespassed to their territorial airspace. Lastly, she has also criticized a possible counter-argument of North Korea regarding a "right of innocent passage" over foreign airspace for its space activates, which is unlikely to succeed.

As a conclusion, the author addressed that North Korea's satellite-launching attempts has contravened international law by, *inter alia*, trespassing the territorial airspace of North Korea's neighbouring countries. Whereas the current response of the UNSC is lawful, the international community or the UN may consider reinforcing their augments with a trespass to airspace, so as to effectively deter North Korea's space ambitions. Instead of using the UNSC Resolution-based arguments, North Korea's neighbouring countries should consider advancing a sovereignty argument that the North Korean overflying launching rockets have trespassed to their territorial airspace.