

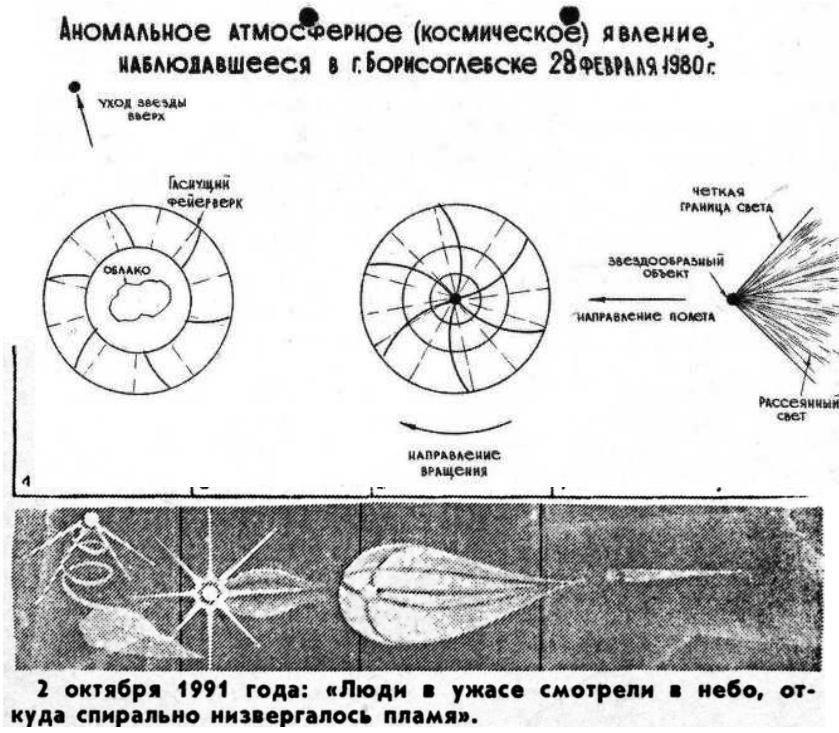
Norway Spiral of December 9, 2009, Fifteen Frequently Asked Questions



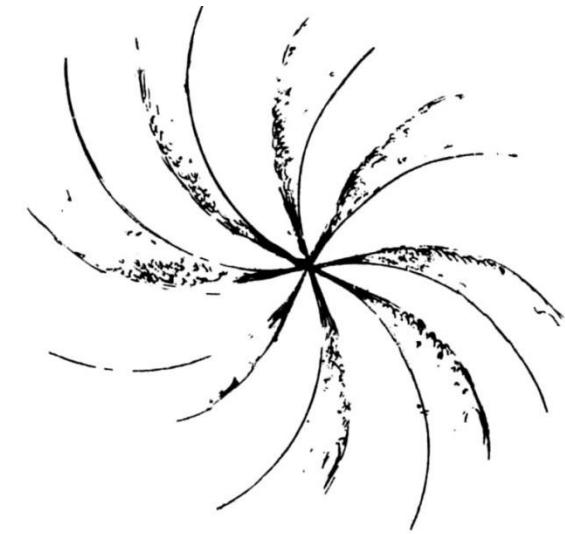
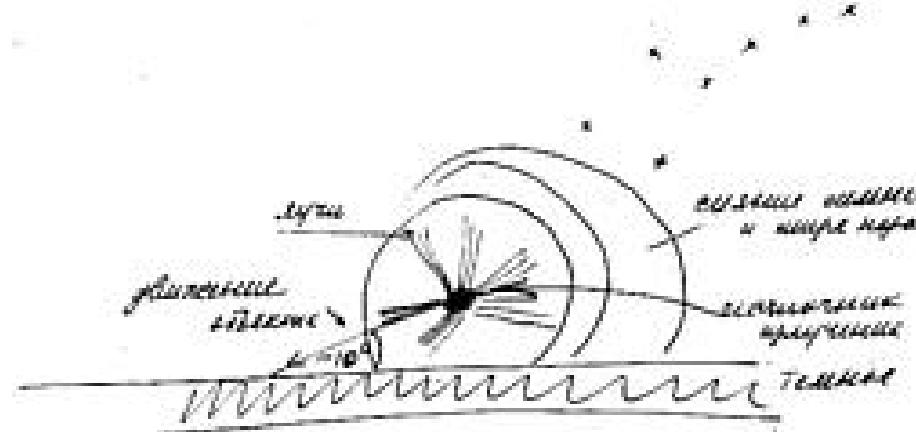
Jim Oberg www.jamesoberg.com

Dec 31, 2016 FINAL DRAFT

Since the dawn of the Space Age, Russian [and neighboring] skies have been filled with astonishing light shows that Moscow officials usually denied any responsibility for – but the CIA probably knew better and just LOVED reading all of the resulting ‘UFO stories’. Only recently have videos become more common.



THESE ARE ROCKET LAUNCHES AT TWILIGHT



V. Одна из форм наблюдавшегося шлейфа. В полете ракета вращается вокруг собственной оси.

THEN ON DECEMBER 9, 2009,
THERE WAS *THIS* ONE



...AND THE WORLD
FREAKED OUT.



What's NEW – a million pocketcams.



<http://ufoholic.com/wp-content/uploads/2016/02/Norwegian-wormhole-ufo.jpg>

The setting

- “About 7:45” to "between 7:50 and 8:00 a.m. local time.“ [gmt + 1] December 9, 2009
- Northern Norway from Harstad to Skjervoy
- Sun barely reaches horizon, max altitude is at 11:46 am, sun due south elevation -1.7 deg
- At event, sun azimuth 128 deg, elev -10.3 deg
- Spiral duration from first video to ‘black hole’, maximum 40 seconds in the videos I’ve surveyed

Mass media sensation

NEWS [Post a story](#) [Text](#) [Email](#) [tehnicka@the-sun.co.uk](#)

Spiral UFO puts Norway in a spin

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Mystery as spiral blue light di above Norway

By MAIL FOREIGN SERVICE
Last updated at 3:32 PM on 09th December 2009
[Comments \(0\)](#) [Add to My Stories](#)

A mysterious light display appearing over Norway last night has left north of the country baffled. Witnesses from Trondelag to Finnmark compared the amazing sight to a meteor or a shock wave - although no one appears to know what it was. The phenomenon began when what appeared to be a blue light started to circulate around a mountain. It stopped mid-air, then began to circulate.

"Spiral UFO", Norveç'i şaşırttı!

Norveç'in kuzeyinden, merkezine kadar geniş [bir](#) alandan izle "UFO", dün sabah filme alındı!

[milliyet.com.tr](#)

Russerne: Det var ikke os

güncellenme zamanı 16.27 | 9.12 Den russiske nordflåde benægter at have opset skylt i morgenens mystiske lysfænomen

13:30 - 09. dec 2009 | Erling Tind Larsen

Telegraph.co.uk

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Strange light in Norway mystery

A eerie turquoise light spotted over Norway has scientists speculating it could be a missile test.

Published: 3:48PM GMT 09 Dec 2009

The Norwegian Meteorological Institute has received hundreds of reports from confused observers but so far has been unable to identify the source. Some experts have speculated that the phenomenon might be a Russian rocket launch. However, the Russian embassy's claims are completely unfounded.

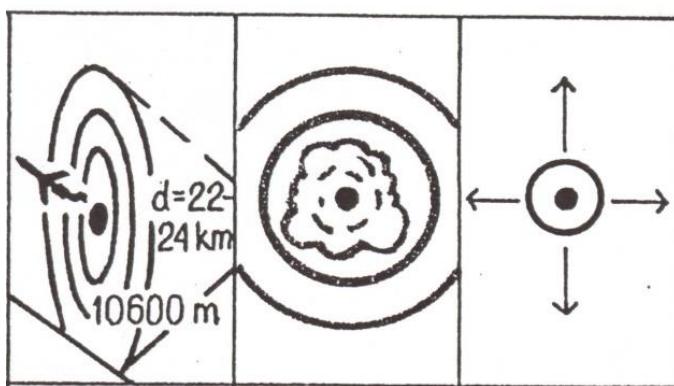
Related Articles

Neither meteorologists, astronomers nor the Royal Norwegian Air Force have offered a solution to the mystery.

Massive UFO event in Norway: possible first open alien contact, images

Fenomenet skapte mange overskrifter, både i Norge og utenlands.

Another in a long series of 'sky spirals'...



... and some relate to missile/space missions not yet identified.

Popular culture explanations

- 1 Aliens
- 2 Wormhole
- 3 HAARP
- 4 EISCAT
- 5 Blue Beam
- 6 Hologram
- 7 Tesla Weapon
- 8 Demon
- 9 Warning to Nobel Committee
- 10 Did I say “aliens”?



norway spiral ufo



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About 49,800 results (0.57 seconds)

09 Dec 2009 - Norway Spiral UFO - YouTube



<https://www.youtube.com/watch?v=k3z8DINZKag> ▾

Dec 9, 2009 - Uploaded by UfoloiiNet

Mas

TENS OF THOUSANDS OF 'HITS'
ON INTERNET SEARCH ENGINES

The Norway spiral



<http://>

Sep 29, 2012 - Uploaded by Linda Menzies

This is **UFO** sky phenomena is NOT fake - this is the world famous **Norwegian** cloud / sky **spiral** that took ...

Strange Spiral light phenomena over Norway coincides with Obama ...



https://www.youtube.com/watch?v=CBUW_MZkQ30 ▾

Dec 9, 2009 - Uploaded by ebrief76

Strange Spiral light phenomena over Norway coincides with Obama Amazing **UFO** opening Stargate Portal ...

Amazing UFO opening Stargate Portal in the Sky (Norwegian Spiral ...

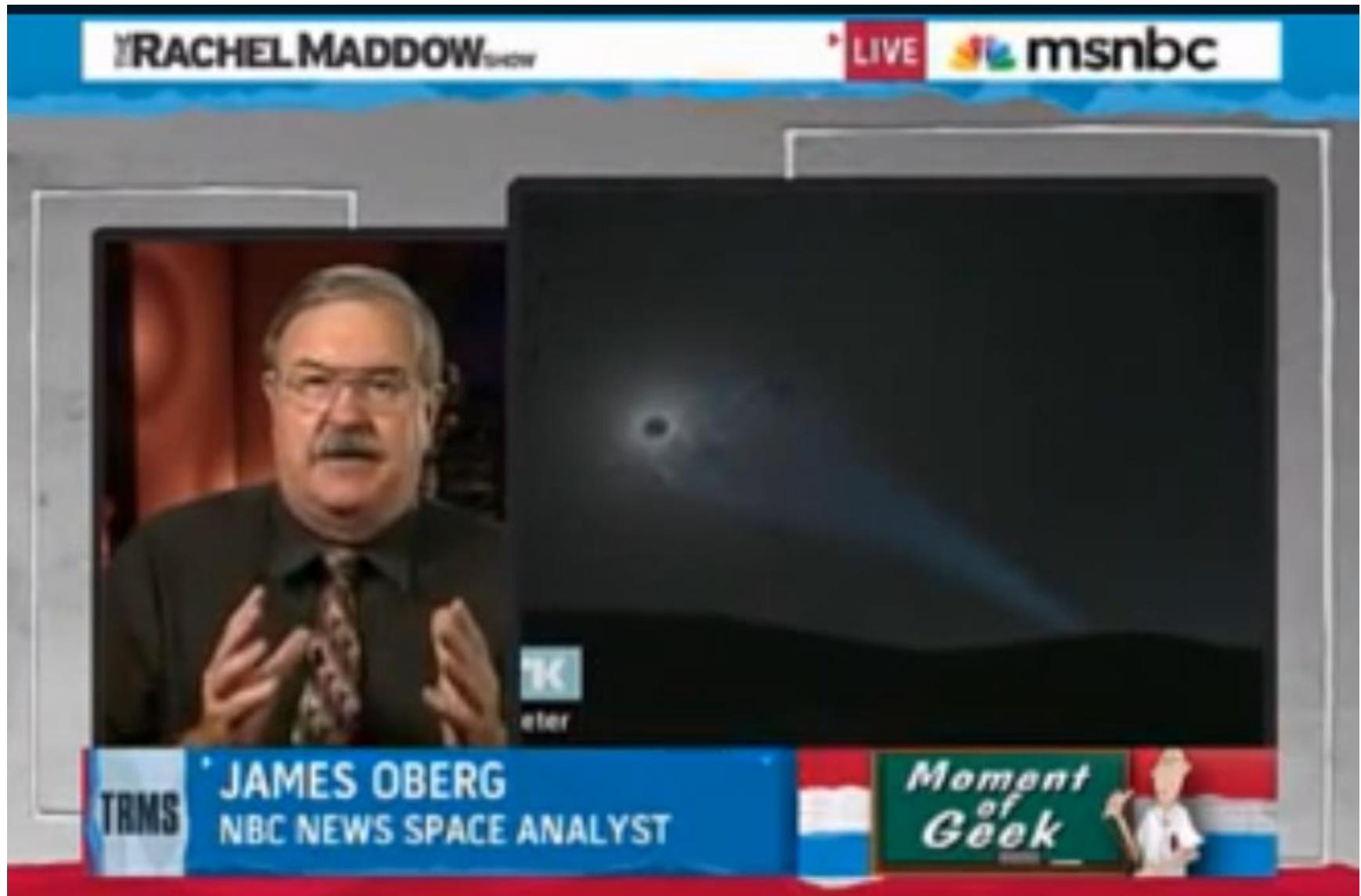


<https://www.youtube.com/watch?v=hJnfTAs4BtM> ▾

Dec 26, 2012 - Uploaded by Mike Stratton

Amazing **UFO** opening Stargate Portal in the Sky (Norwegian Spiral ... The Science Channel talks about the ...

My small role in media coverage



<https://www.youtube.com/watch?v=DWuKE4H81rw&t=208s>

'SPECTRUM' magazine [on line]

Russia's Ailing ICBM Program

Spiral over Norway latest in string of failures

By James Oberg

Posted 19 Jan 2010 | 21:23 GMT



<http://spectrum.ieee.org/aerospace/military/russias-ailing-icbm-program>

<http://skyspirals.blogspot.com/>

Sky Spirals

What in the hell *are* they?

POPULAR REACTIONS

Sunday, April 17, 2011

**Collection of rare sky spiral phenomena-Jaime
Maussan UFO conference 2010**

**MYSTERY IN THE SKY
STRANGE BLUE LIGHTS RAISE QUESTIONS**



Common Questions

- 1. What was it?
- 2. Why did the Russians test a missile over Norway?
- 3. Why wasn't a warning issued?
- 4. Why did the Russians deny it?
- 5. Why was it so visible?
- 6. Then why didn't the Russians see it too?
- 7. How could a 'missile failure' create a perfect double spiral?
- 8. How could a missile create a 'black hole'?
- 9. If a missile, why not previous tests seen?
- 10. What was unusual about THIS launch?
- 11. How could it appear again the next day over Russia?
- 12. How was it similar & dissimilar to other missile tests?
- 13. Why don't people believe the missile explanation?
- 14. Could astronauts on the ISS have seen it?
- 15. Why are such apparitions appearing all around the world?

FREQUENTLY ASKED QUESTION 1.

What was it?

Missiles and spacecraft can create visible spirals in space through several distinctly different processes

- Post-launch booster sep via immediate propellant venting
- Later ‘safing’ through surplus propellant dump
- ICBM warhead spin-up at bus deployment
- ICBM upper stage spinning ‘thrust dumping’ – programmed
- ICBM upper stage spinning ‘thrust dumping’ -- malfunction
- Upper stage failure during ascent with tumbling ruptured tank
- Payload failure in orbit with fluid leak
- On-orbit propulsive maneuver with loss of attitude control
- Deliberate waste water or tracer gas release
- Other

Different events will differ in ejecta velocity, plume spread and duration, plume thickness, number of plumes, rotation rate, and other factors

Bulava - the lightest ballistic missile of its type

Russia's newest ballistic missile still under development

Specifications

First and second stage propellants - solid-fuel rocket; third stage propellant - liquid-fuel rocket (to allow high maneuverability during warhead separation)

Launch from inclined position allows a submarine to fire Bulava missiles in movement

The missile can carry up to 10 hypersonic, individually guided, maneuverable reentry vehicles

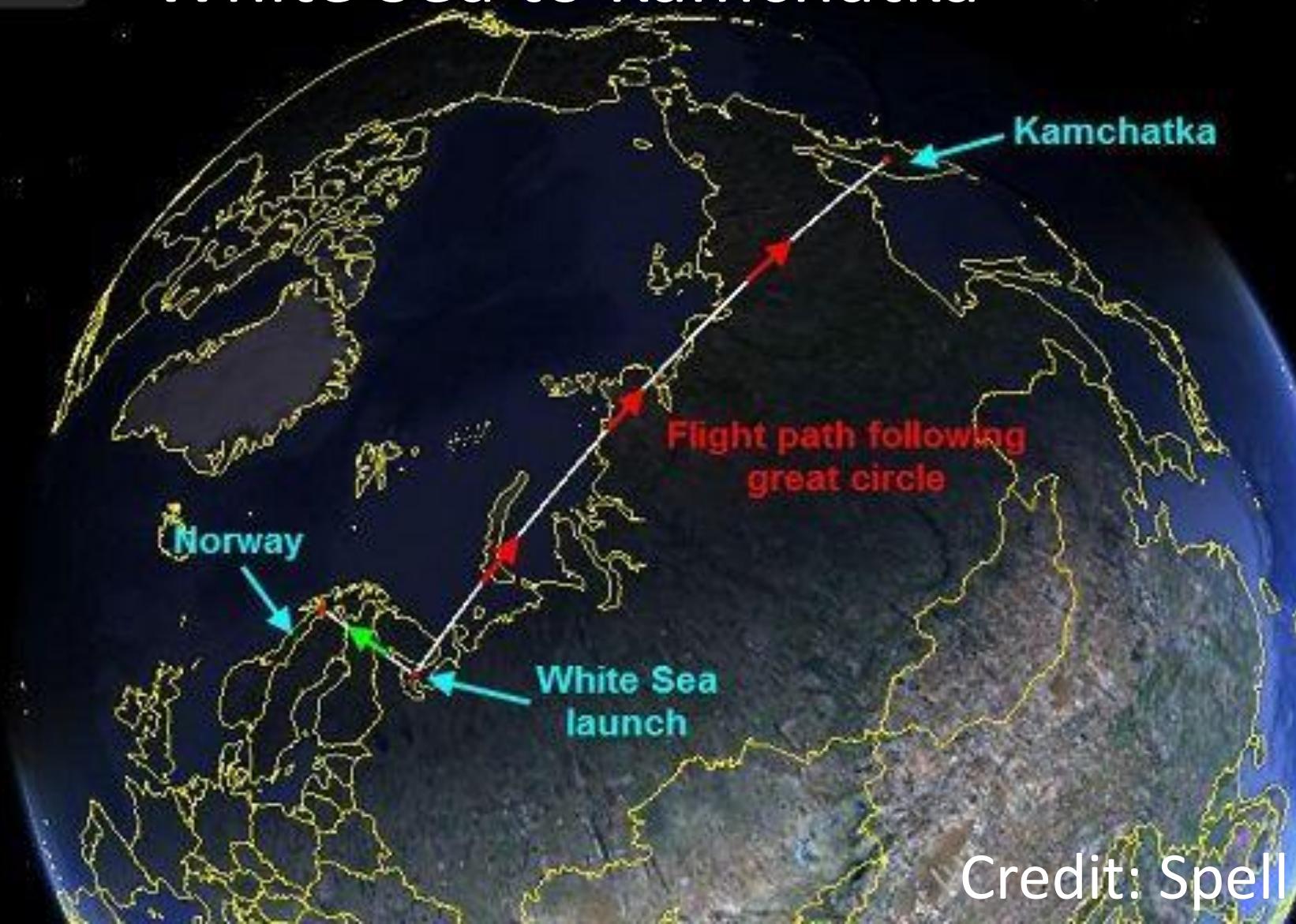
Due to a low-altitude flight pattern, Bulava could be considered a "quasi-ballistic" missile



BULAVA MISSILE

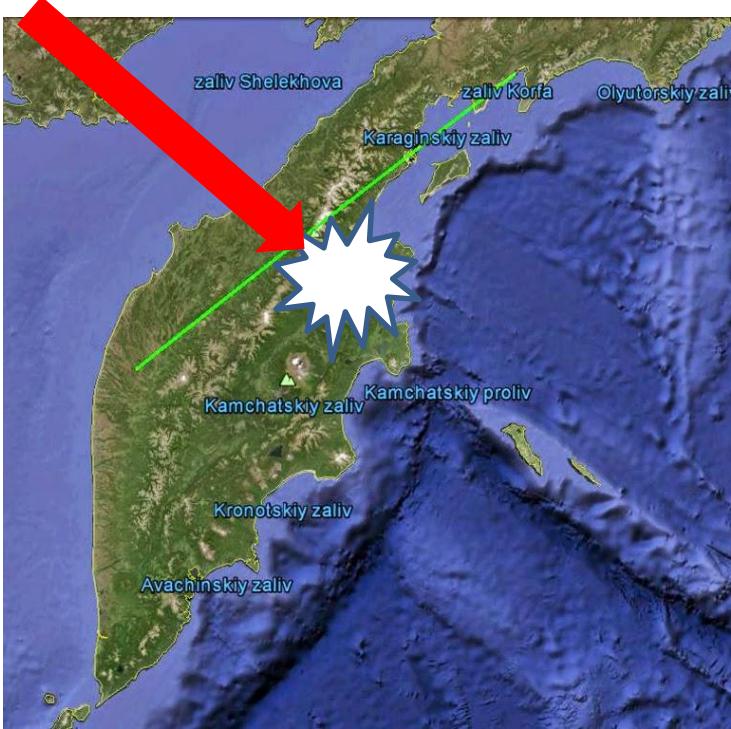
Dec 9, 2009 7:47 am

White Sea to Kamchatka



Credit: Spell

“Kamchatka” is not just a RISK board square



**IT'S BEEN THE
IMPACT ZONE
FOR RUSSIAN
LONG-RANGE
MISSILE TESTS
FOR ALMOST
SIXTY YEARS**

Estimation of the Location, Trajectory, Size, and Altitude of the "Norway Spiral" Phenomenon

Tony Spell, M.Sc. Ocean Engineer // 12/29/09

Abstract -- A seemingly structured and complex display of swirling light, now referred to as the "Norway Spiral," was observed by many on the dawn of December 9th, 2009. Despite the official cause being reported as a Russian missile failure at high altitude, this event has continued to generate much debate and controversy over its origin and nature. Part of the debate has centered around pinpointing the actual location of this phenomenon, as it was primarily witnessed from the northwest regions of Norway, leading some to conclude that it must have occurred over Norway, while others argue that it was much further east over Russia. In this study, we focus only on the location and progression of the event, through the process of intersecting multiple vectors or "lay lines" established through the superposition of Norway's ubiquitous mountainous backgrounds in Google Earth's 3D terrain model, with photographs of this phenomenon at known locations. The results locate the event over the Russian Kola Peninsula and province of Murmansk near the west coastline of the White Sea. [continued]

-

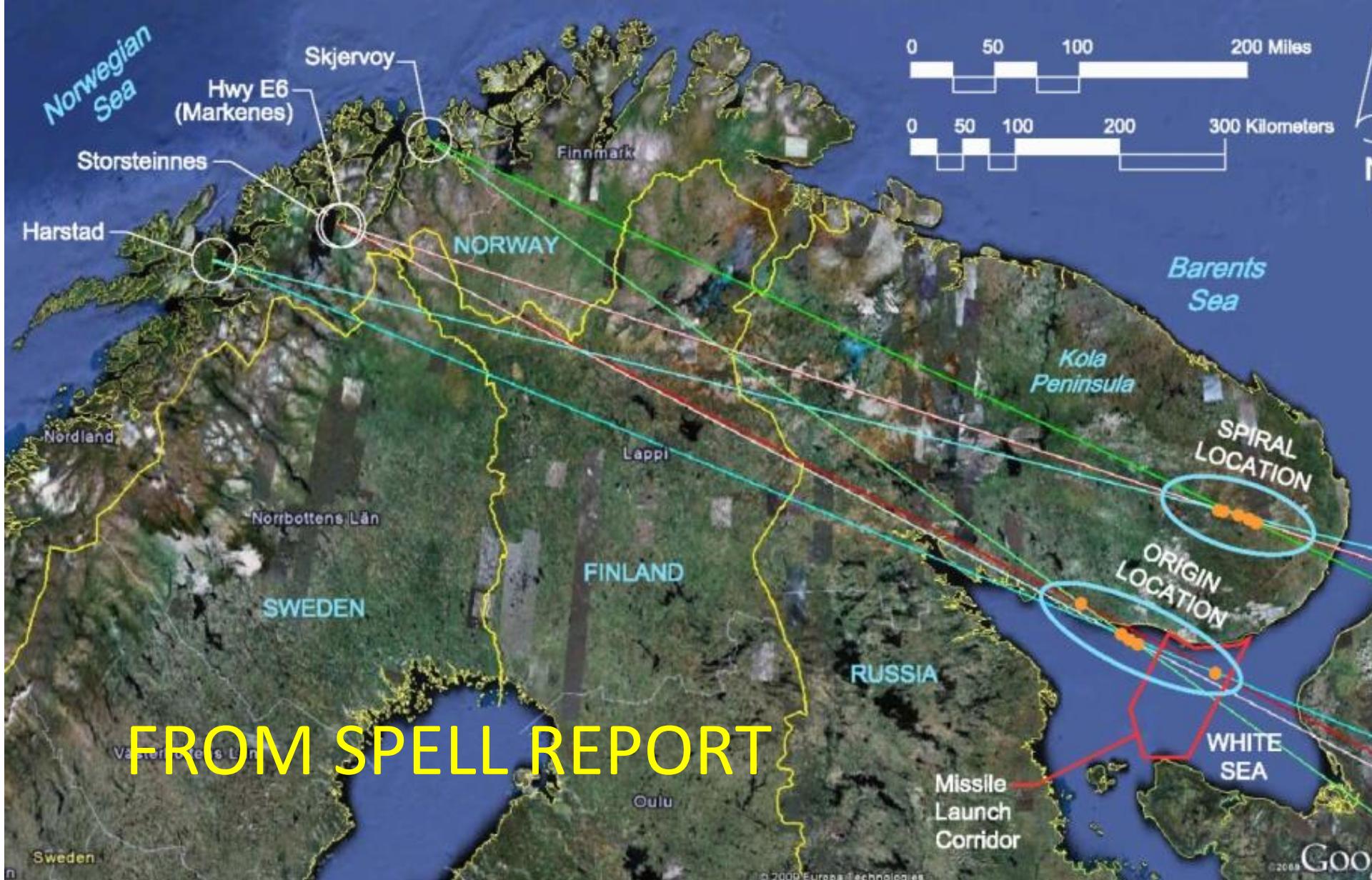
http://www.spellconsulting.com/reality/Norway_Spiral.html

Spell report – part 2

The development of the spiral occurred approximately 60 miles (97 km) inland (west) of the White Sea then traveling northeast across the peninsula and out over the Barents Sea, with the final dissipation of the spiral occurring approximately 143 miles (230 km) northeast of its initial development and some 70 miles (113 km) offshore.

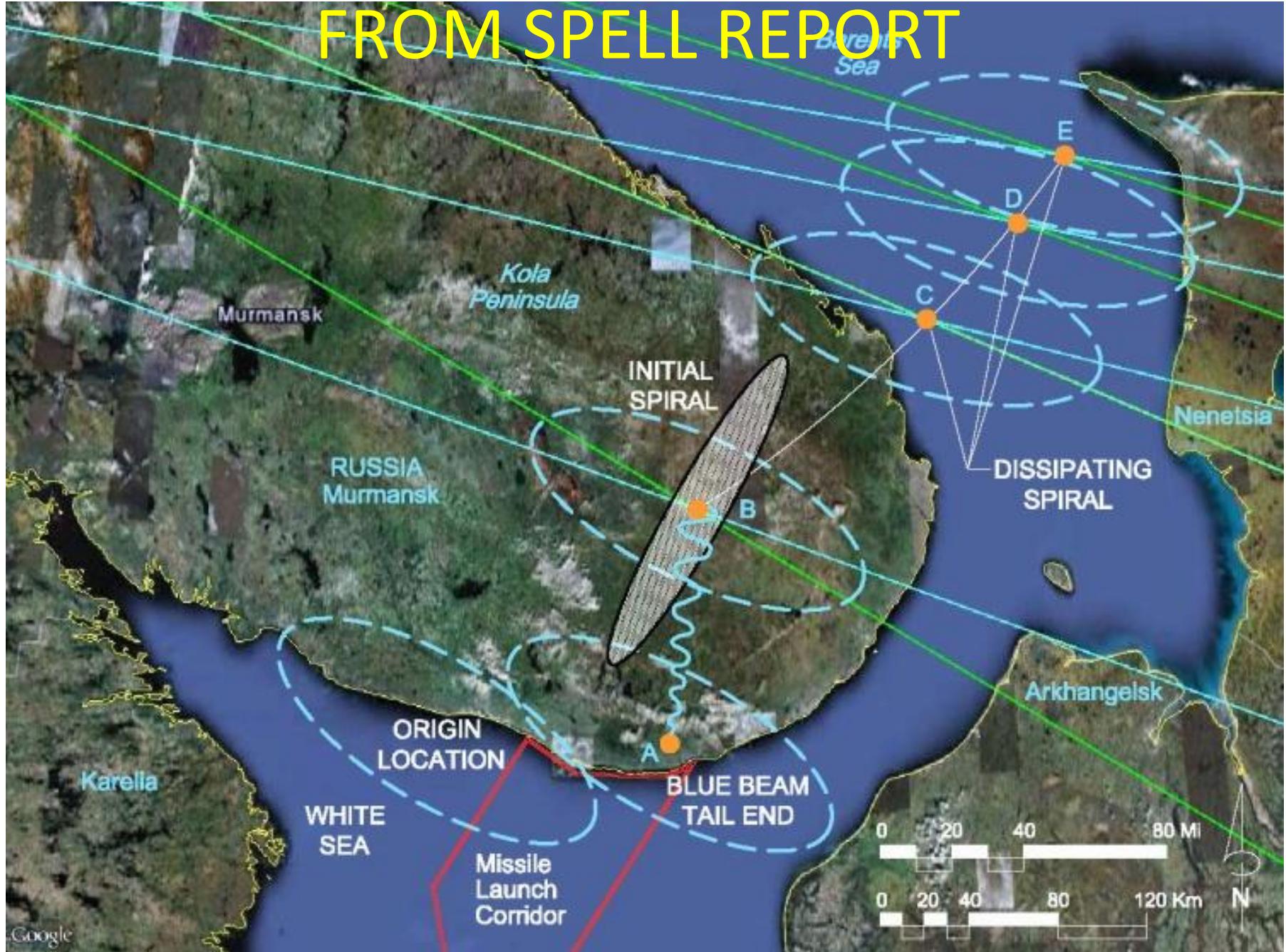
In addition, the center of the spiral was calculated at a very high altitude ranging from 107 to 166 miles (172 to 267 km) during its progression, with the initial size of the spiral measured at approximately 95 miles across (153 km). At the time of dissipation and expansion of the void, the spiral grew to an approximate scaled width of 391 miles (629 km), reaching a remarkable altitude along the upper edge some 351 miles (565 km) above sea level.

Due to these great altitudes, exceeding the established astronautics/aeronautics boundary of 62 miles (100 km), this event occurred primarily in space, and therefore was not subject to significant atmospheric effects. **Although the spiral appears to be slow moving in the video, the vast distance of the observation from over 530 miles (853 km) only gives this illusion.** From the video frame captures and the subsequent vector analysis, the estimated velocity of the spiral center along the trajectory was found to exceed 8,000 mph (12,875 kph). The combined expansion of the void and the north-northeast trajectory of the center, give an estimated velocity of the leading edge of the void (northward) at an incredible 13,000 mph (20,920 kph).



Results of convergence analysis showing probable locations of the origin and center of spiral during its early stage

FROM SPELL REPORT



Movement of spiral tracking towards northeast showing path of dissipation.

FREQUENTLY ASKED QUESTION 2.

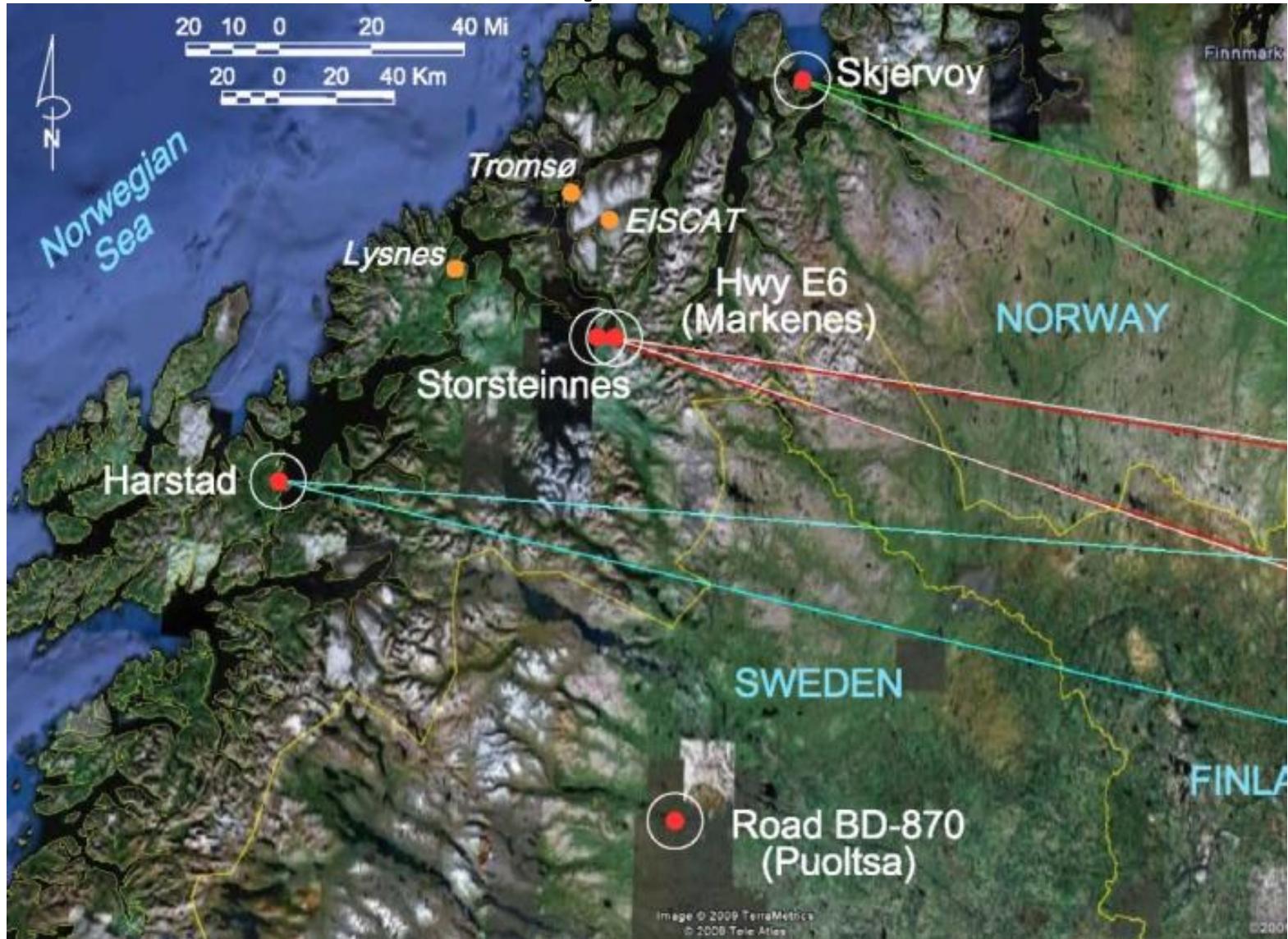
Why did the Russians test
a missile over Norway?

It was never “over” Norway



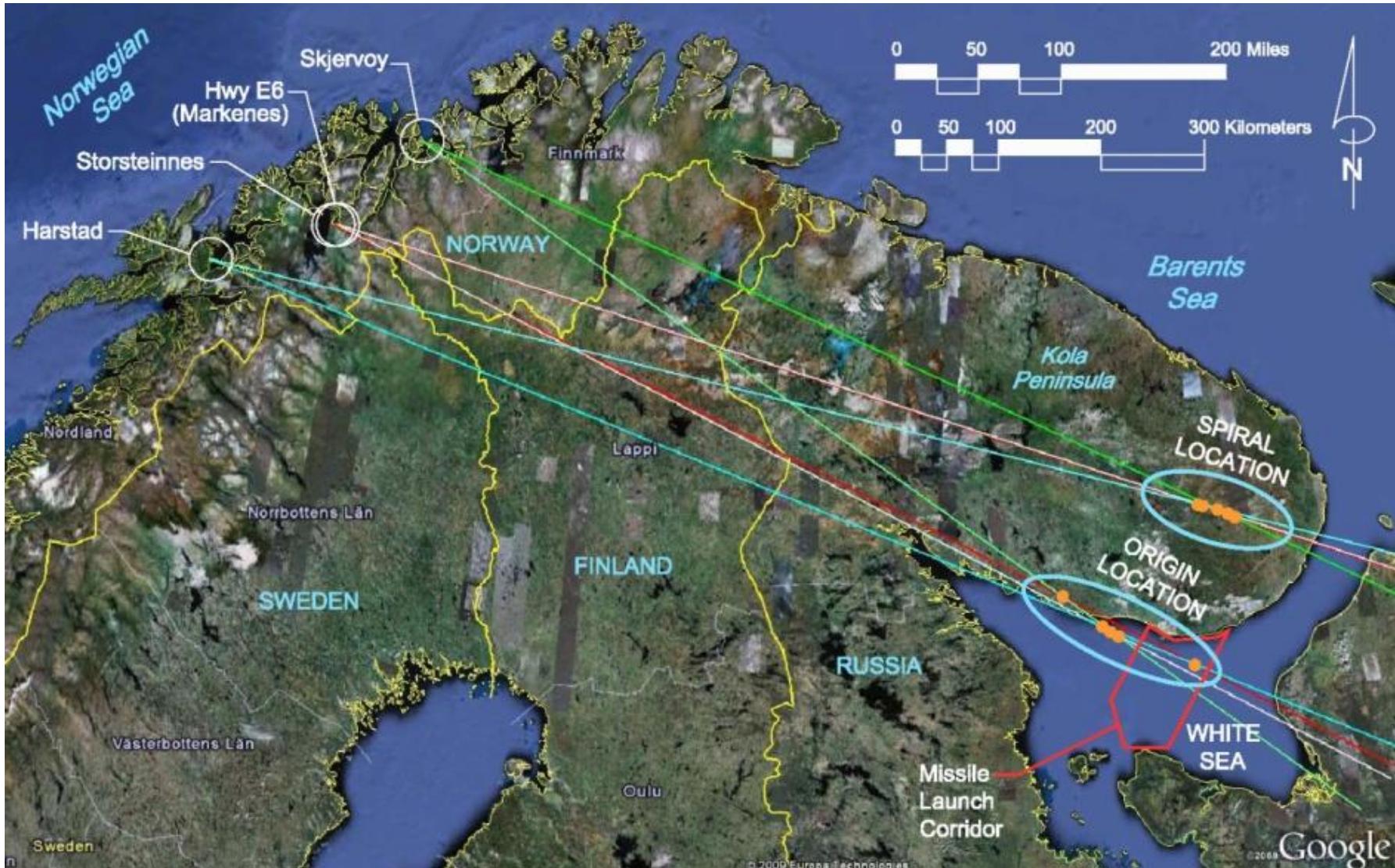
“Moon Over Miami” is only a song, we all know the moon is much farther away than any foreground.

All sites saw ‘spiral’ to the east...



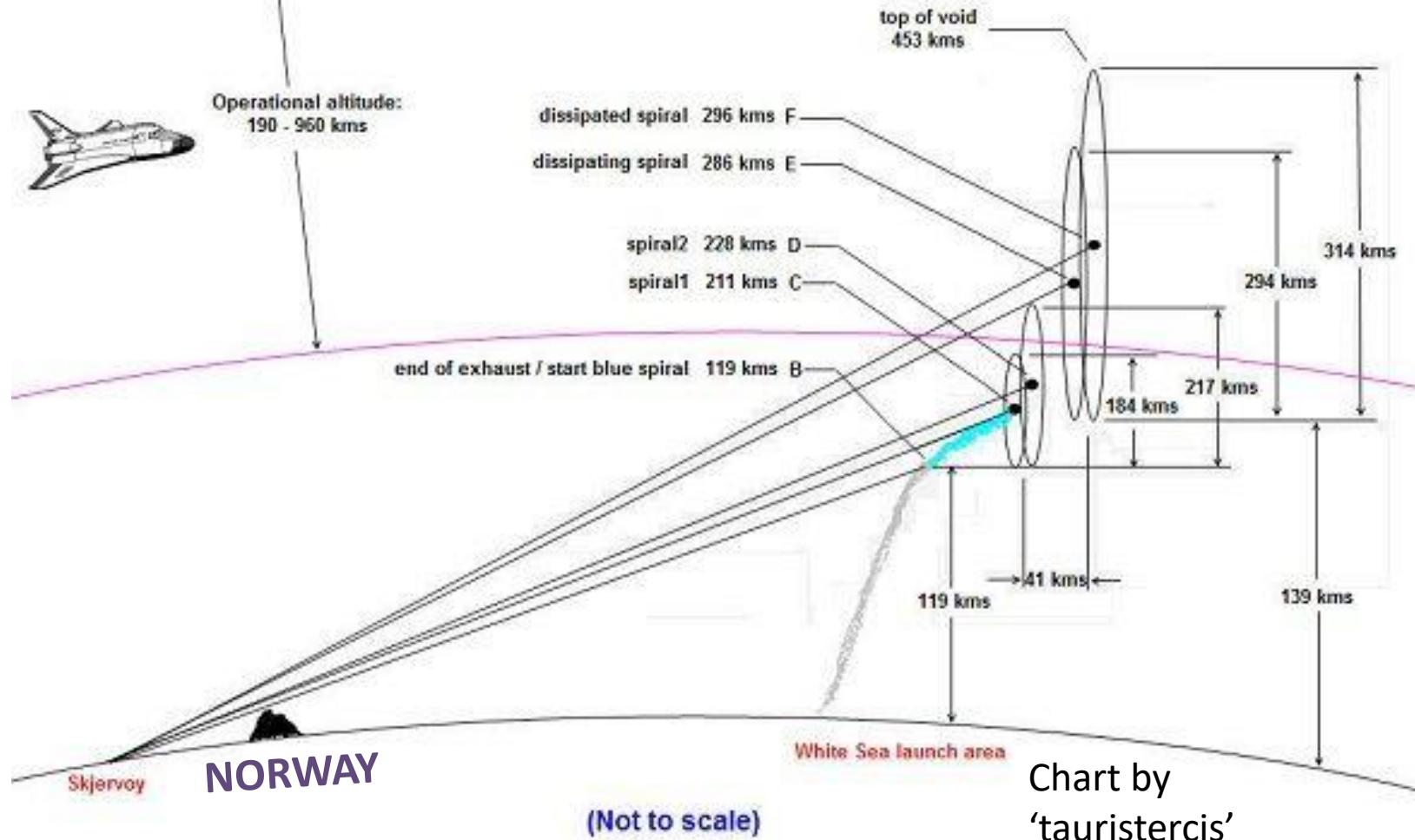
- Spell, 2009

Triangulation shows it was over Russia



Spell, 2009

TRIANGULATION SHOWS SPIRAL IS VERY FAR AWAY FROM 'OVER NORWAY'



<http://www.abovetopsecret.com/forum/thread539943/pg1>

FREQUENTLY ASKED QUESTION 3.

Why wasn't
a warning issued?

It was – exactly as normal.

- All activities that are hazardous to air and sea traffic are announced in advance in a system called ‘Notice to Airmen and Mariners’ or NOTAMS
- There are standard public-accessible data bases containing all such notices that sea and air traffic controllers consult regularly
- The notice contains the locations, altitude ranges, and the time intervals that traffic is warned to avoid
- Beyond the NOTAMS system, Moscow and Washington have treaty obligations to inform each other in advance of any missile launchings even within their own borders
- News agencies rarely if ever note or publicize such routine information

NOTAM

- <https://en.wikipedia.org/wiki/NOTAM>
- A **Notice to Airmen (NOTAM or NoTAM)** is a notice filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight.
- NOTAMs are issued (and reported) for a number of reasons, such as:
 - hazards such as air shows, parachute jumps, kite flying, lasers, **rocket launches**, etc.
 - military exercises with resulting airspace restrictions

NOTAM Explained

NOTAM Identifier

Effective Dates of NOTAM

OID90 Area

A3947 141228 1412280330/1504280830/EST

REF AIP PAGE ENR 5.1.3-9, OID90 ACTIVATED,

DURING ACTIVITY AWY R794 BTN DHN VOR/DME AND TBS VOR/DME CLSD

Airway R794

Dehnamarak VOR/DME
and Tabas VOR DME

Decoded using ICAO Abbreviations and Codes

Prelaunch alert message, 'Norway spiral'

ZCZC FA79

031230 UTC DEC 09

= DATE DEC 03, [20]09 AT 1230 GMT

COASTAL WARNING ARKHANGELSK 94

ACTUAL LAUNCH

SOUTHERN PART WHITE SEA

09 DEC 0645 GMT

1. ROCKET LAUNCHING ~~2300 07 DEC TO 0600 08 DEC~~

~~09 DEC 0200 TO 0900~~ 10 DEC 0100 TO 0900

NAVIGATION PROHIBITED IN AREA 65-12.6N 036-37.0E

65-37.2N 036-26.0E 66-12.3N 037-19.0E 66-04.0N 037-47.0E

66-03.0N 038-38.0E 66-06.5N 038-55.0E

65-11.0N 037-28.0E 65-12.1N 036-49.5E

THEN COASTAL LINE 65-12.2N 036-47.6E

2. CANCEL THIS MESSAGE 101000 DEC=

NNNN

<https://web.archive.org/web/20100318000903/http://forum.flot.su/showthread.php?p=102072>

REVISED MESSAGE

THREE DAYS LATER

= DATE DEC 07, [20]09 AT 1400 GMT

ZCZC FA80

071400 UTC DEC 09

COASTAL WARNING ARKHANGELSK 95

SOUTHERN PART WHITE SEA

1. ROCKET LAUNCHING 2300 10 DEC TO 0800 11 DEC

0900 TO 1700 11 DEC 2100 11 DEC TO 0600 12 DEC

1000 TO 1700 12 DEC 2200 12 DEC TO 1000 13 DEC

1100 TO 1700 13 DEC 0100 TO 1400 14 DEC

0100 TO 0700 AND 1600 TO 2200 15 DEC

NAVIGATION PROHIBITED IN AREA 65-12.6N 036-37.0E

65-37.2N 036-26.0E 66-12.3N 037-19.0E 66-04.0N 037-47.0E

66-03.0N 038-38.0E 66-06.5N 038-55.0E

65-11.0N 037-28.0E 65-12.1N 036-49.5E

THEN COASTAL LINE 65-12.2N 036-47.6E

2. CANCEL THIS MESSAGE 152300 DEC=

NNNN

FREQUENTLY ASKED QUESTION 4.

Why did the Russians deny it?

"We have no information about such a thing, and has never seen anything like what you describe", said an anonymous spokesperson for the Russian Northern Fleet to [Norway newspaper] VG Nett

“The Russians” didn’t – one Russian might have

- It’s unclear from press reports exactly WHICH various Russian officials WERE asked about.
- Initial questions seem to have been concerning a ‘missile test’ over Norway, and Russian officials could honestly answer they had no information
- Ostensibly a Russian clerk at a West European embassy was asked, and said he had no information -- truthfully
- Moscow confirmation of Bulava failure the next day did say the sighting was caused by a missile test but as usual provided no specifics on the location

FREQUENTLY ASKED QUESTION 5.

Why was it so visible?

A lucky combination of factors

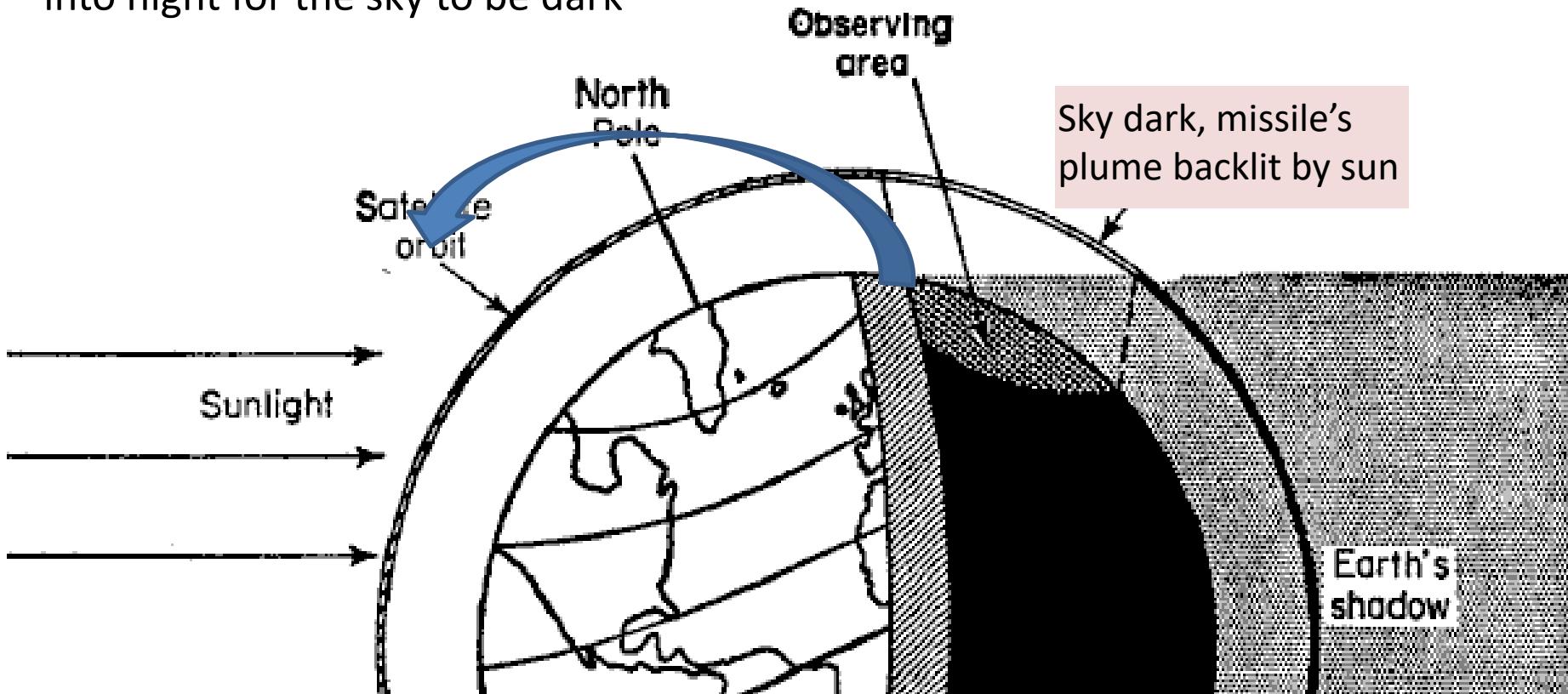
- TIMING of launch just at dawn meant observers to the west still had a dark sky while the plume was high enough to be in sunlight
- CLEAR SKIES meant that the sunlight plumes could be seen from the ground
- DEMOGRAPHIC HABITS [e.g., school hours] meant that large numbers of potential witnesses were outside at this particular time

Factors affecting visibility

- Cloudiness
- Sky darkness
- Horizon topography
- Illumination of target
 - Sunlight
 - Other light sources
 - Self-luminous

twilight visibility

As with observing artificial satellites,
the target must be high enough to be
sunlit while the observer is far enough
into night for the sky to be dark



Local relief can occult critical portions of trail

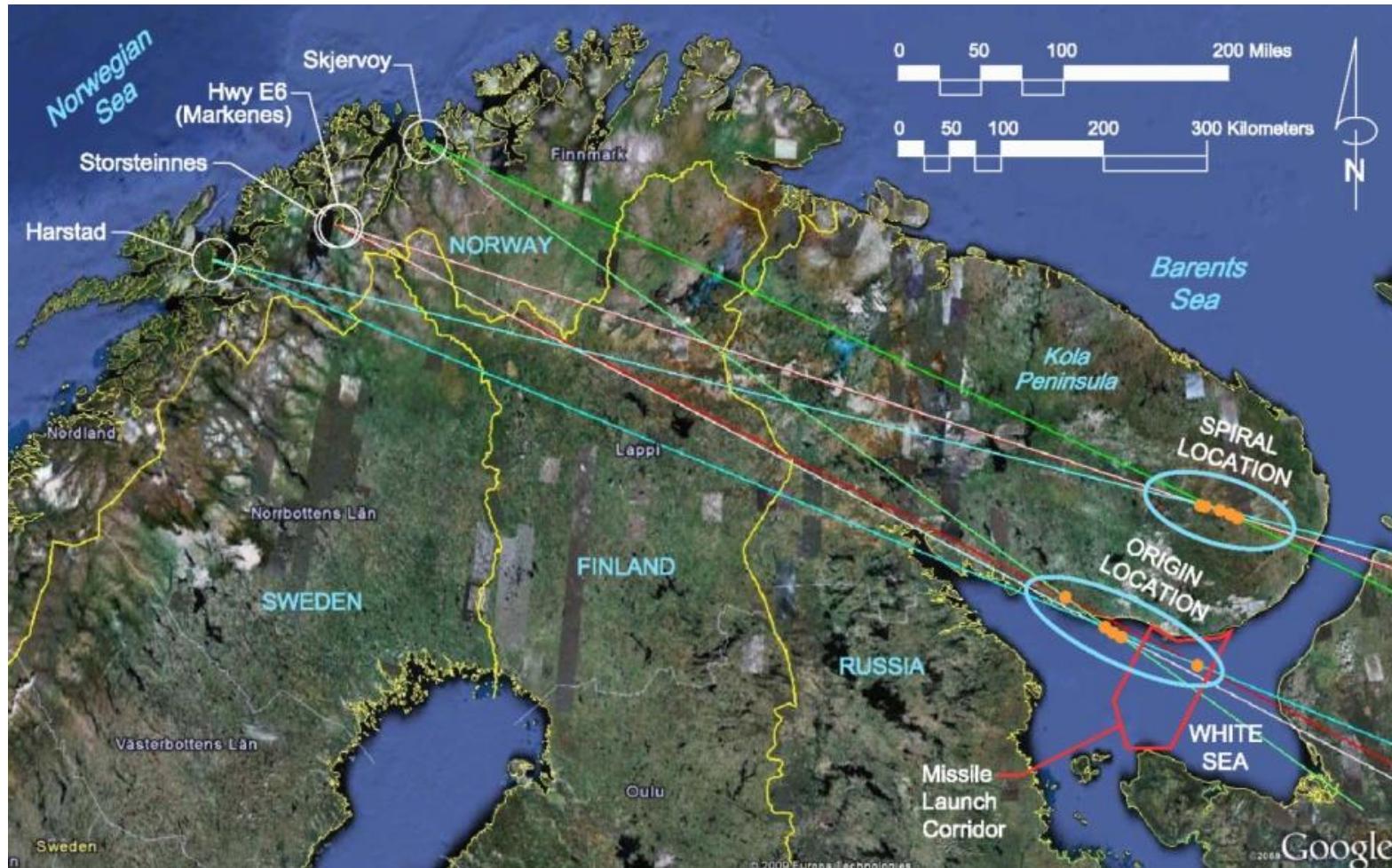


Puoltsa, Sweden, clear eastern horizon [no mountains]

FREQUENTLY ASKED QUESTION 6.

Then why didn't the
Russians see it too?

Why only reports/images from far western regions?



- Spell report

Near launch site, sky was already bright, cloudy.

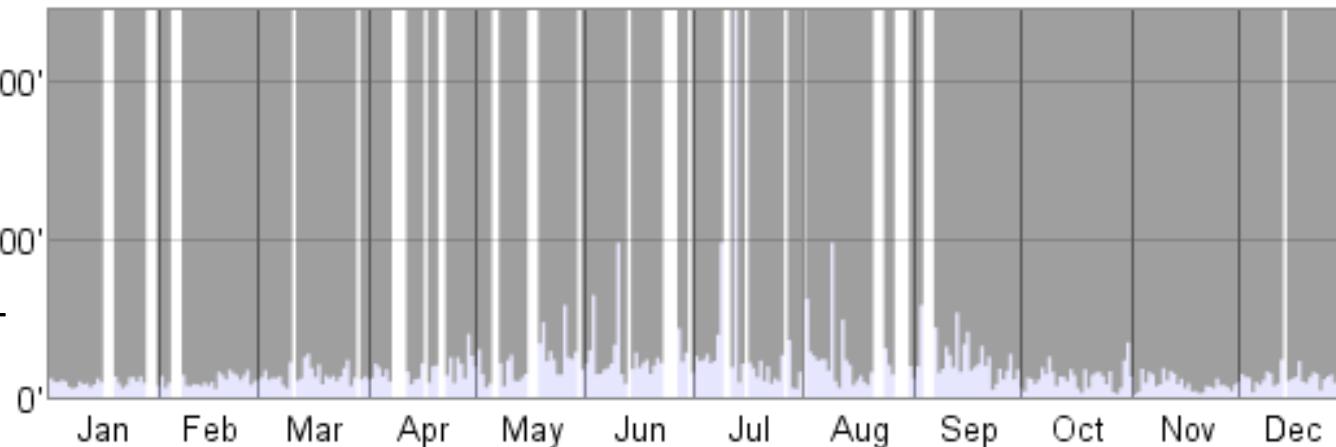
- 0700 gmt Kola Peninsula, 41E Sun az 164, el -0.3
- Civil twilight begin 0602, sunrise 0742
- Arkhangelsk gmt + 3, sunrise 0702 gmt
- Sun az 164, elevation +1.6
- <https://weatherspark.com/history/33818/2009/Arkhangelsk-Arkhangelskaya-obl-Russia-Federation>

Heavy clouds most of December

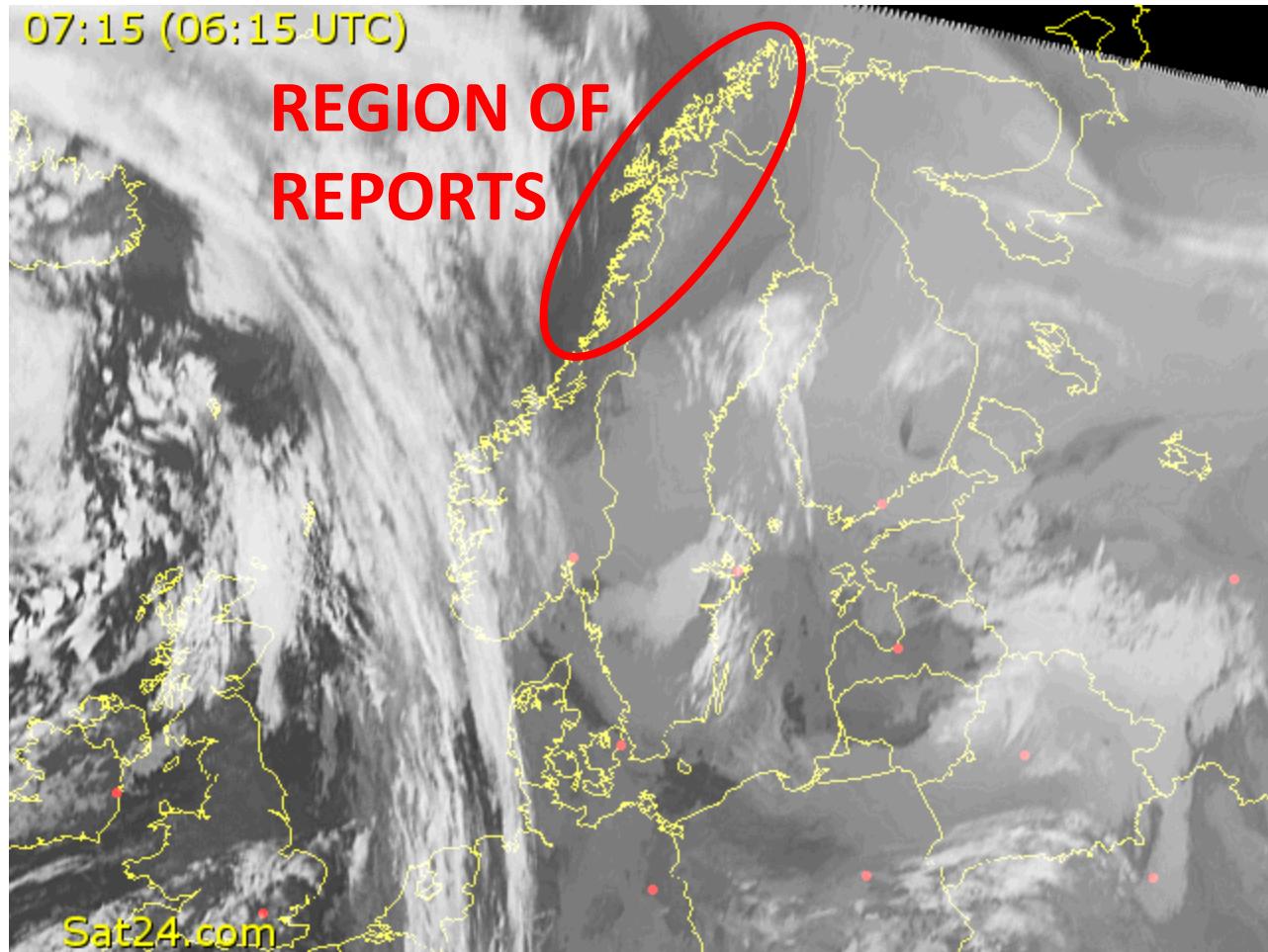
[sat photos

show cover]

CEILING HEIGHT



Why only seen in few places?

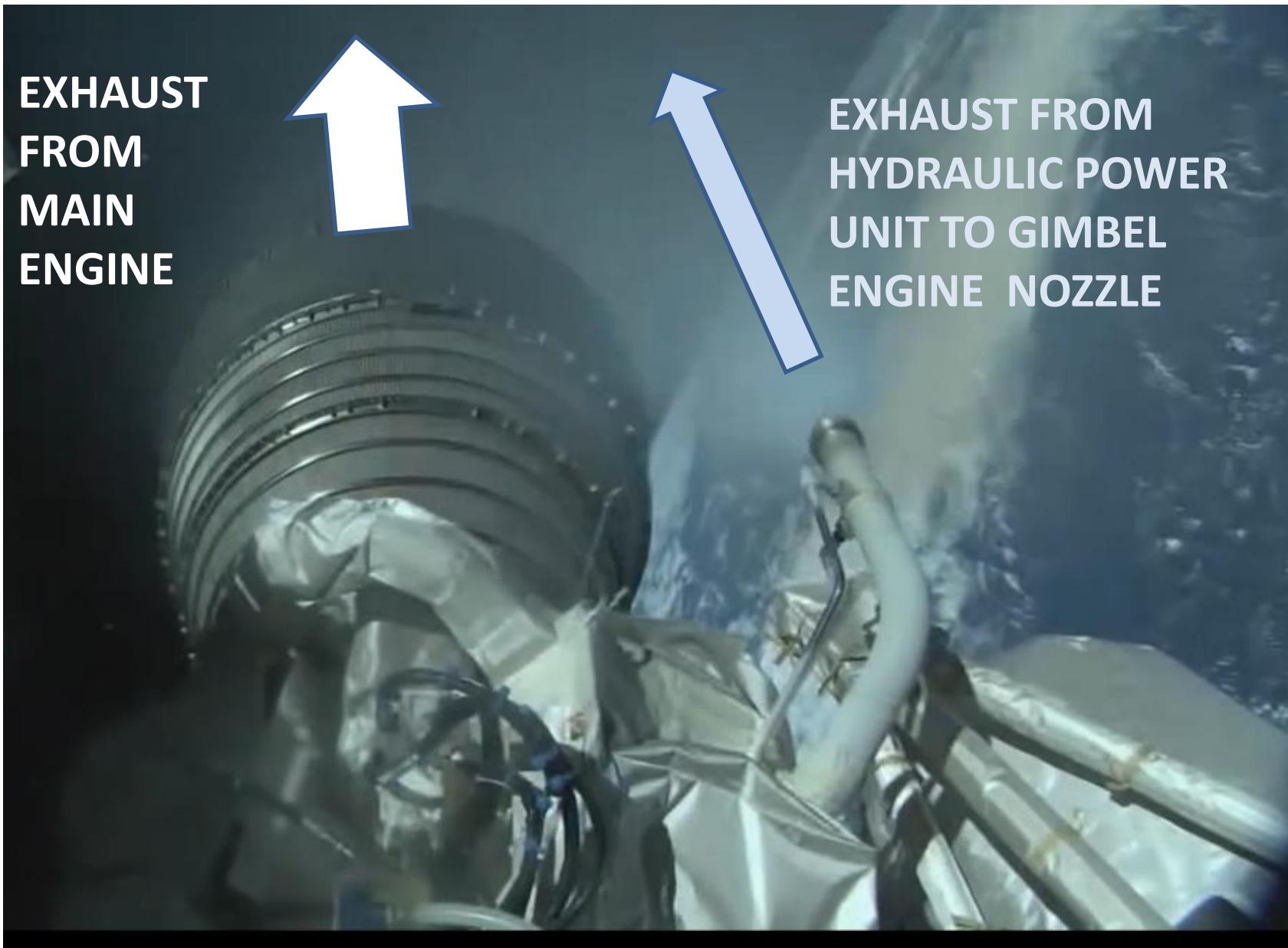


- Cloud cover – determined by IR metsat images
- Sky brightness – low-contrast effluent masked by dawn
- GOOD luck that effluent was sunlit at all

FREQUENTLY ASKED QUESTION 7.

How could a ‘missile failure’ create a perfect double spiral?

Twin trails often a feature of UPPER stage engines



Compare secondary blue plume on Norway spiral [left] and on Trident SLBM on Nov 7, 2015 [right]



BOTH IMAGES SHARE WHITE PLUME OF MAIN ENGINE EFFLUENT AND A NARROWER BLUE PLUME POSSIBLY FROM THE HYDRAZINE-FUELLED HYDRAULIC POWER UNIT [HPU] NEEDED TO SWIVEL THE ENGINE NOZZLE [UNDER NEARLY IDENTICAL SOLAR BACKLIT ILLUMINATION CONDITIONS]. MUCH SLOWER PLUME EJECTION SPEED FROM HPU VERSUS ENGINE CREATES THE MUCH NARROWER PLUME SPREAD PATTERN AS OBSERVED.

RECENT REPORT BY RUSSIAN SCIENTISTS SUGGESTS THE COLOR REFLECTS THE SPECIFIC MOLECULES OF BURNED SOLID PROPELLANT

4.1. *Turquoise missile track*

A major CP component of the solid fuel is aluminum oxide Al_2O_3 ($\sim 40\%$ by mass), which represents the fine fraction. At high temperatures, the formation of aluminum monoxide, AlO , occurs. AlO exists in a gaseous state. Resonant scattering of sunlight by these molecules causes the luminescence in the wavelength region 4374–5424 Å, which corresponds to the turquoise color of the gas-dust trail of the rocket.

“THIRD STAGE FAILURE”

- Official Moscow report specifically referred to failure in the third stage
- Plume trail and timing [60 seconds per stage] are consistent with third stage anomaly
- This missile’s test program has been the most troubled and catastrophic sequence in decades
- Loss of attitude control could account for both bright plume and narrower blue plume corkscrewing
- Although unusually long in duration, such sky corkscrews had been observed before

'Spiral' was actually two nested spirals



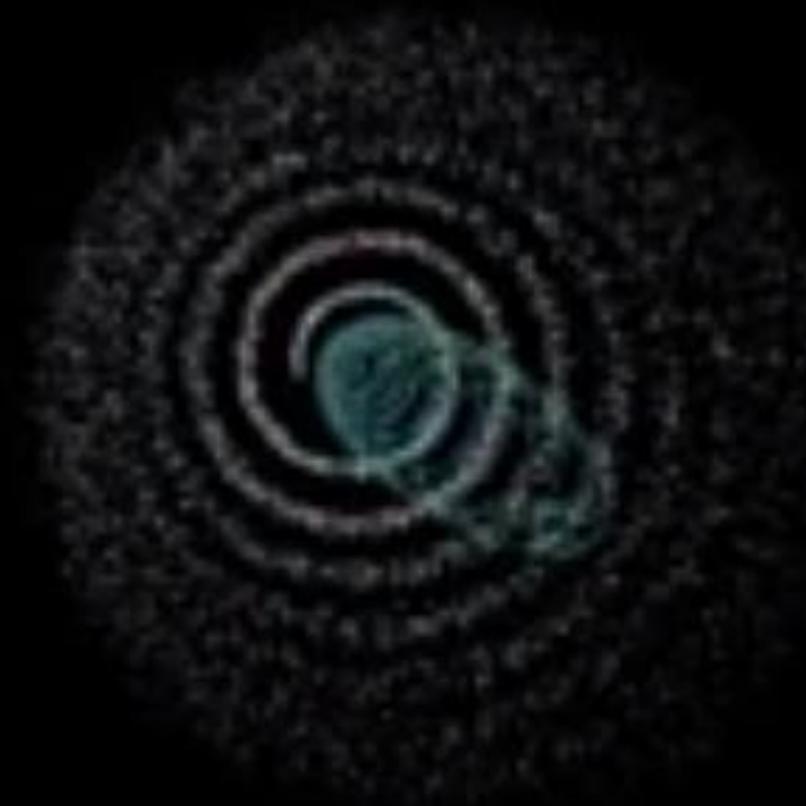
© Svein-Egil Haugen

Rotary lawn sprinkler



DESCRIPTION of droplet motion – parade of individual particles each flying straight outwards from central dispenser

Doug Ellison computer simulation



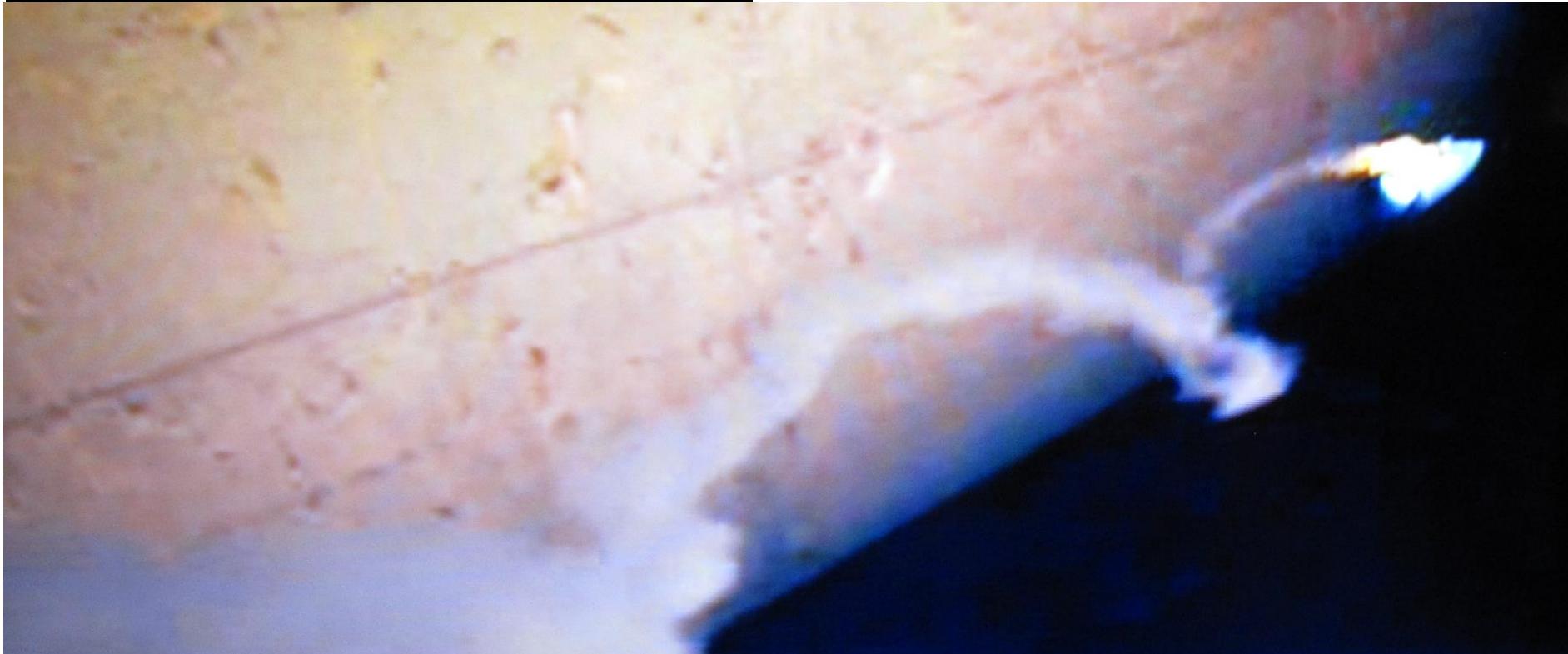
<https://youtu.be/Zx8i5EfmyU4>

NOT A ‘CORKSCREW’





RECENT DOCUMENTARY
ON FIREARMS SHOWED
SPINNING BULLET WITH
TINY SMOKE EMITTER
CREATING A SPIRAL



NOT analogous to Norway spiral

The bullet test was in atmosphere so the smoke stopped dead as soon as it was emitted except for slight outward motion that widened the corkscrew.

Sideways emitted effluent particles in a vacuum retain the forward motion of the emitting object plus their own right-angle motion, creating a bizarre-looking moving expanding flat-plane spiral.

If emitting object is accelerating it may ‘pull ahead’ of the spiral flat-plane but only slightly considering great speeds involved, hard to notice from behind.

Nature of Bulava's third stage

- Some press accounts report it is liquid-fueled
- But also it's claimed it's a 'naval version' of the Topol ICBM which IS all solid fuel plus small liquid-fueled 'warhead bus' module.
- If solid fueled [most likely], anomalous pluming could be associated with design feature called a 'thrust dump port'.
- If liquid fueled, vehicle tumble could still account for observed pattern

Solid-fuel stage ‘thrust dumping’

- Wikipedia: “More advanced solid rocket motors can not only be throttled but also be extinguished and then re-ignited by controlling the nozzle geometry or through the use of vent ports”
- THIOKOL: Thrust Termination Port. == A port provided in the rocket motor case to vent combustion gases so that rocket operation can be terminated. The port usually is provided for in the head end of the motor so that gas flow is effectively diverted from the nozzle. The port is formed by firing a shaped charge of explosive placed against the outside of the forward end of the motor.

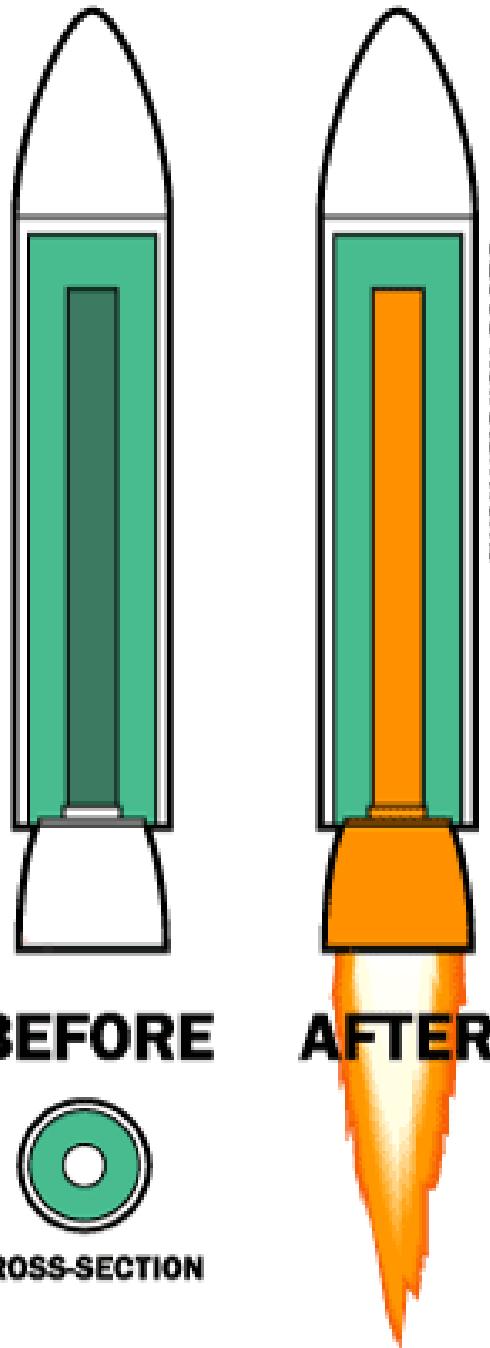
RUSSIAN SCIENCE REPORT IN 2016

The phenomena accompanying rocket launches of both liquid and solid propellant engines are very similar. However, there is a certain type of phenomenon unique to the launches of solid propellant missiles [6].

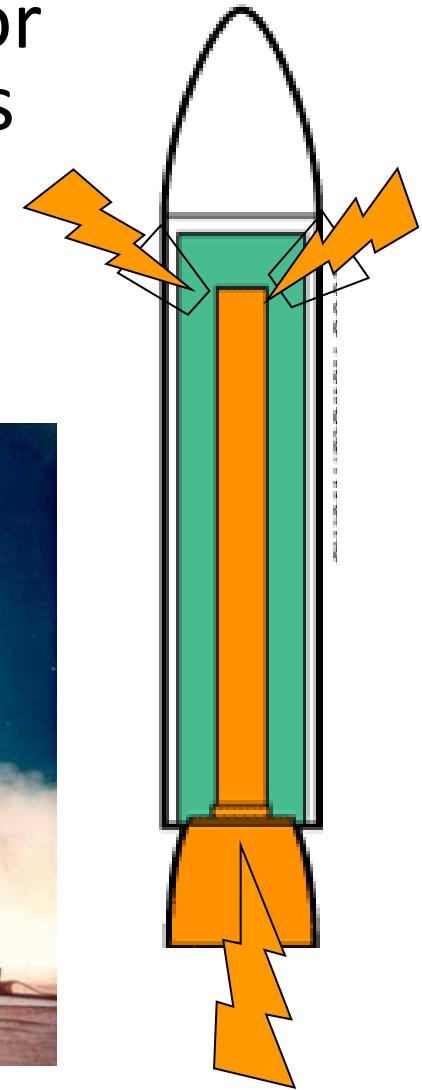
The forms of gas-dust clouds of solid fuel CPs depend on the rocket height and the engine operation mode, as well as on the methods of engine thrust cut-off [7]. A solid fuel engine shutdown is achieved by means of a sharp decrease in the pressure within the combustion chamber. If this process is performed by opening the side flaps and the rocket rotates around the longitudinal axis, then the dust trail will take the form of a spiral. Upon release of pressure through the front valve, the observer can see two torches suddenly emerging in front of the rocket and behind it. In the mode of reverse thrust, the luminous cloud can adopt many different forms, depending on the method of this operating mode implementation. Note that during engine activation and cutoff, large dispersed particles, which produce intense light dispersion, are released into the environment due to incomplete fuel combustion.

Thrust termination for solid-fuelled engines

To cut off forward acceleration,
panels are jettisoned to allow
plume to exit from the front and
symmetrically off to the sides



CROSS-SECTION



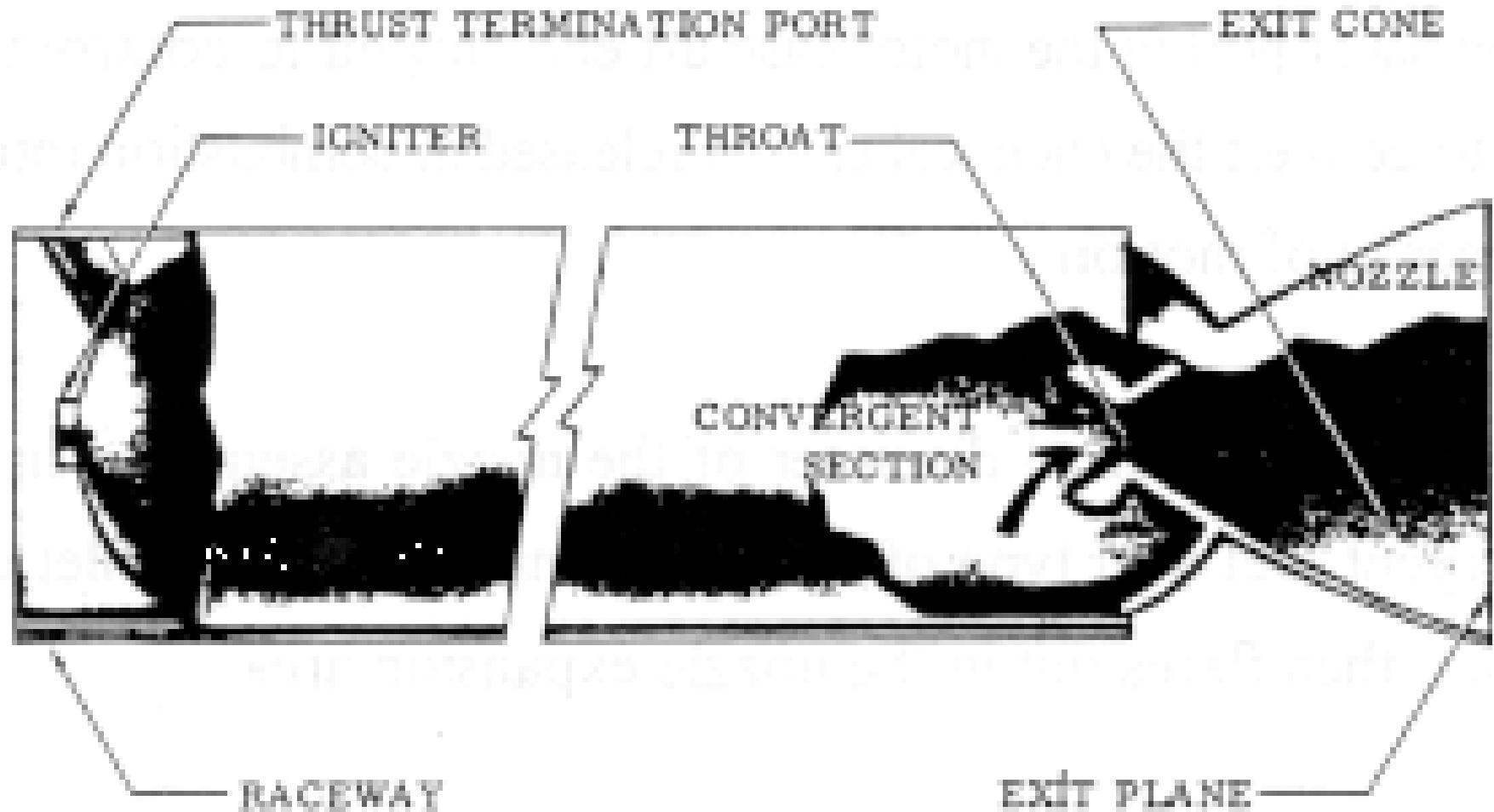
NOTE HOW LARGE SOLID ROCKETS BURN FUEL FROM ALONG A CENTRAL HOLLOW AXIS, NOT FROM ONE END TO THE OTHER.

ZERO THRUST

Thrust-dumping

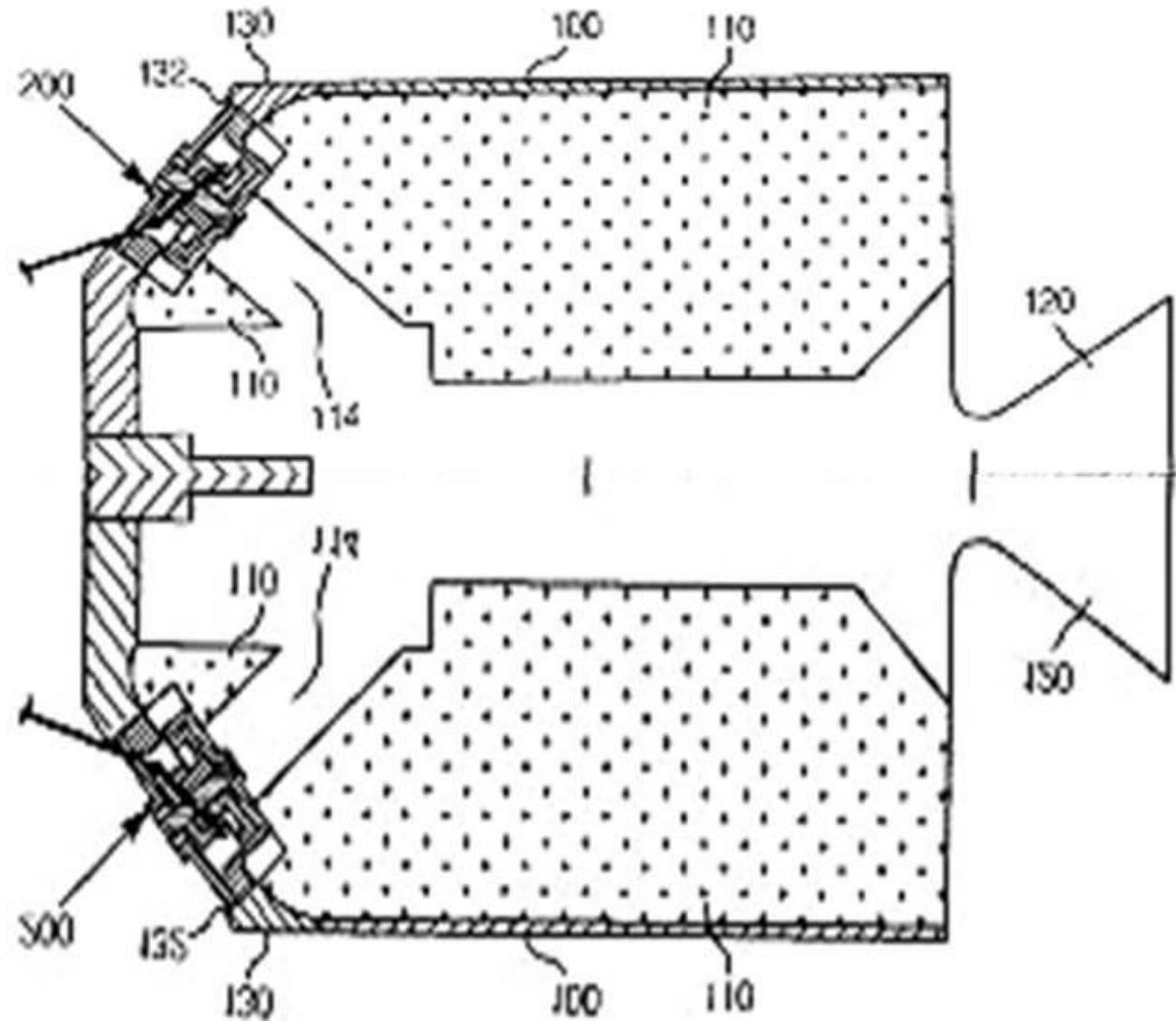
- Unlike liquid or hybrid rocket stages [which can be turned off with propellant flow valves when adequate final velocity is reached], a solid engine must burn until fuel is exhausted
- Some ballistic trajectories short of maximum range need to dump thrust well before normal burn-out duration
- Thrust is terminated early by opening paired ‘dump ports’ in rocket’s nose that fully balance remaining forward thrust
- Last stage also usually rotates rapidly for stability and also as countermeasure to effects of anti-missile energy weapons
- Exhaust velocity is usually 8000-9000 ft/sec perpendicular
- Rotary motion creates strikingly regular double-spiral pattern similar to rotating twin-nozzle lawn sprinkler
- At burnout the coiled exhaust spirals quickly expand away from point of origin leaving background sky clearly visible

Thrust Termination Port



Symmetrical vent ports for solid rocket motor thrust termination

Fig. 1



DESCRIPTION OF
FUNCTION --

Common videos of missile failures
are NOT good analogies



DISCUSSION

- Images show something spinning
- Known features of missile propulsion systems create linearly expelled plumes
- Such plumes from rotating dispensers will create spirals of startling regularity

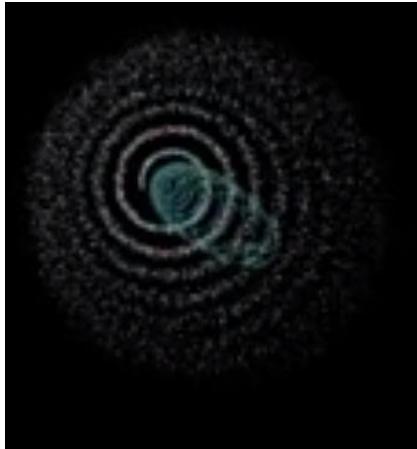
FREQUENTLY ASKED QUESTION #8.

How could a missile
create a ‘black hole’?



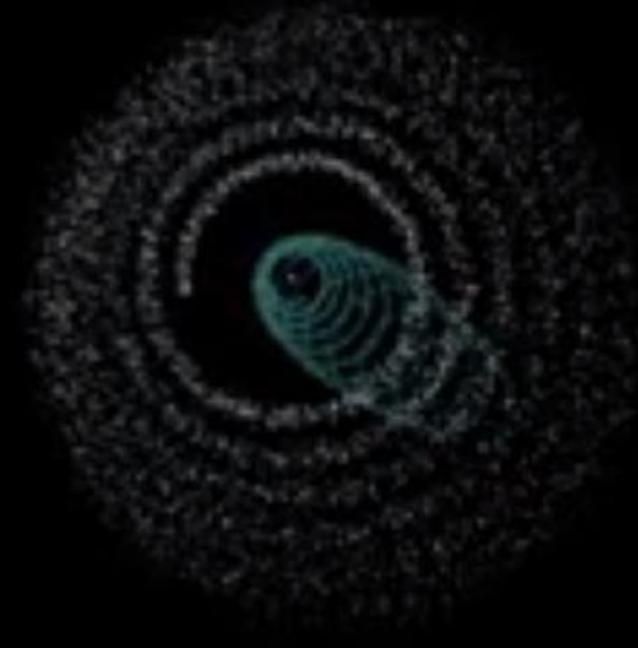
THE 'BLACK HOLE' OF SCANDINAVIAN SKY

Doug Ellison computer simulation



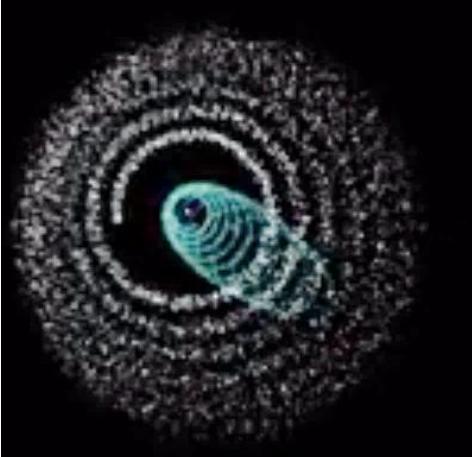
ALL PARTICLES IN THIS SPIRAL ARE MOVING RADIALLY OUTWARDS FROM THE AXIS OF MISSILE FLIGHT. THEY ARE NOT SPINNING AROUND THAT AXIS.

To not misunderstand the dynamics of the spiral you must envisage the ballistic motions of individual particles in the effluent.



Once particles are no longer being emitted from the vehicle, those already in flight keep on departing in straight lines and clear the center.

<https://youtu.be/Zx8i5EfmyU4>

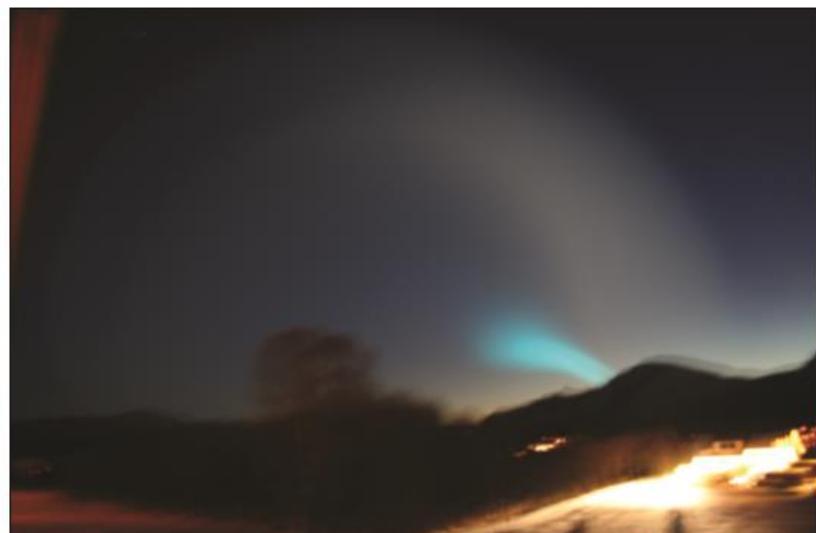
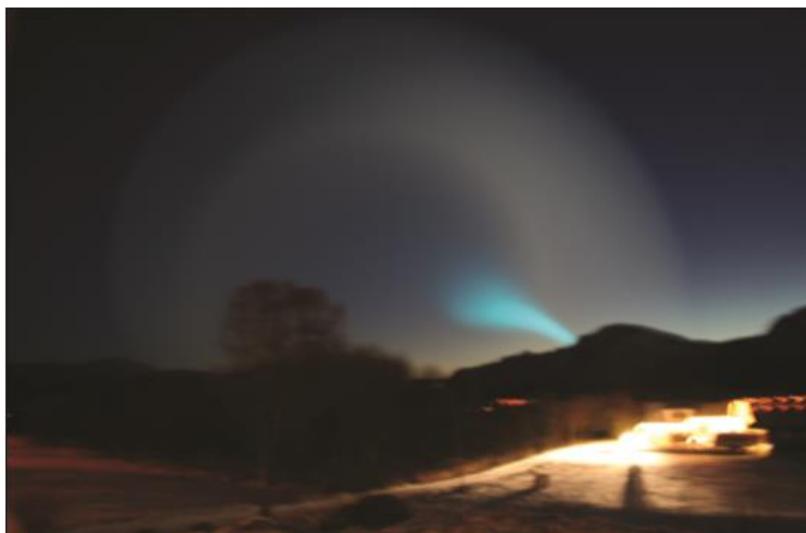


The pluming of the third stage abruptly stops, after which the effluent field particles still departing radially, expose the dark of the background sky

STILLS FROM VIDEO SHOW SHARP CUTOFF OFF PLUME FLOW AS OUTER LOOPS CONTINUE EXPANDING



“BLACK HOLE” IS JUST BACKGROUND DARK SKY



Four pictures of Morten Kristiansen, taken from Ånstad, Sortland in Nordland. Canon EOS 350D digital camera, with exposure times of 6 and 8 seconds. Time from the camera's metadata is 07.56, but is more likely around 07.50 from comparison with other photos.

FREQUENTLY ASKED QUESTION 9.

If a missile, why not
previous tests seen?

PREVIOUS OBSERVATIONS

- Just a few weeks earlier
- Sunday 1 November 2009, in 4 o'clock in the morning was a similar phenomenon (but in much smaller scale) seen from Hammerfest. An observer, Catrijne Brokke described a mysterious light that moved rapidly on the horizon in an easterly direction and looked as if it fell to the ground. "It was big as a full moon, and got bigger and bigger as a kind of explosion. I've never seen anything like that before, "she said.
- Brokke is also a photographer and ran in and fetched the camera and recorded the phenomenon. She estimated that it lasted a total of three to four minutes until it was gone.
- However, it was quickly apparent that the whole thing was about a rocket launch. According to a message from the Russian news agency RIA Novosti same day, the nuclear submarine "Bryansk" had conducted a launch test of an intercontinental ballistic missile from its underwater position somewhere in the Barents Sea. Warheads reached the target at the right time, and the test was a success.

Hammerfest, Norway // Nov 2009



Ball of light and vapor trail seen in eastern sky

Soviet missile test from Finland, 1983



Missile launch of Oct 2, 1991 observed from Ufa & Severodvinsk

2.10.91

ФАЗЫ ПОЛЕТА ОБЪЕКТА

У - для наблюдателя в г. Уфе

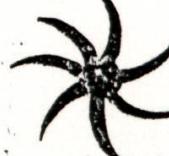
С - для наблюдателя в г. Северодвинске

1



Пятно
треугольной
формы

2



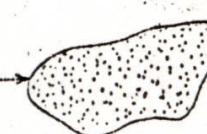
Сpirалевидный
сгусток
голубого цвета

3

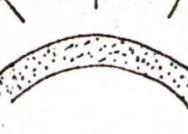


Радиально
расходящиеся
кольца

4



Облако
зеленоватого
цвета

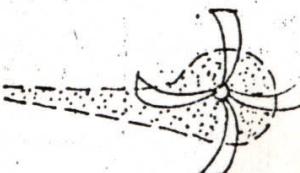


Дуга
белого
цвета

17ч.52м

у

с



Белый шар
со шлейфом
или лучом

Остановка
шара,
разрастание
шлейфа и
окраска его
в зеленый
цвет

Сжатие объекта
и появление
радиальных,
спирально
загибающихся
белых лучей,
相伴隨着
物体的
收缩和
出现
辐射状的
螺旋形
弯曲的白光
束。

Оставшийся
от объекта
след

Oct 2, 1991 – Severodvinsk, Ufa, Arkhangelsk views of missile launch

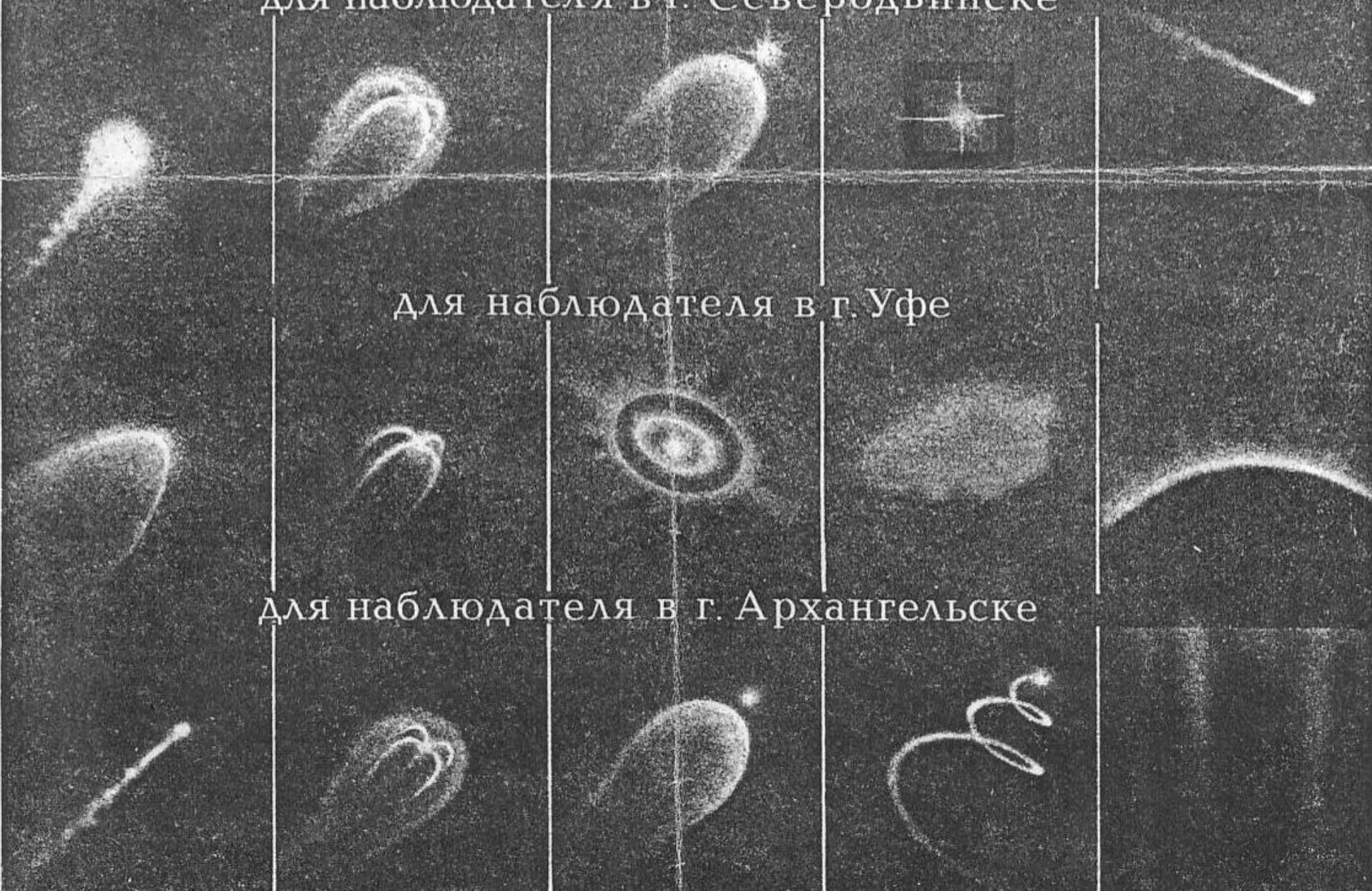
Фазы «НЛО-эффекта» во время запуска баллистической ракеты 2 октября 1991 года

Рисунок В. ВОЙТЮКА

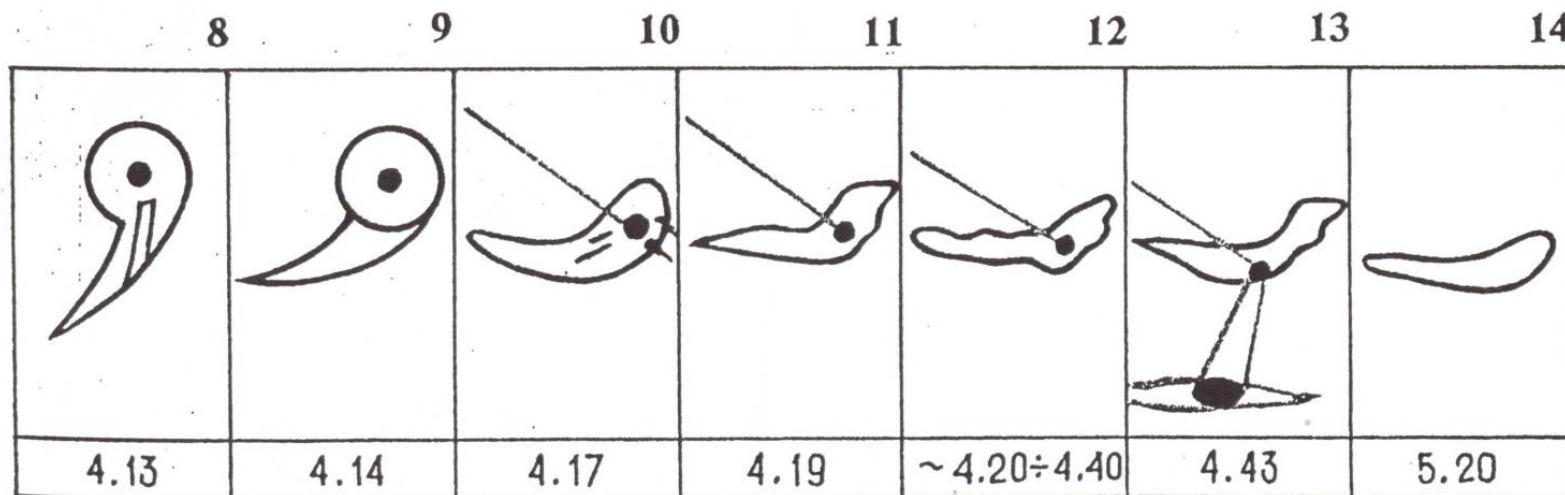
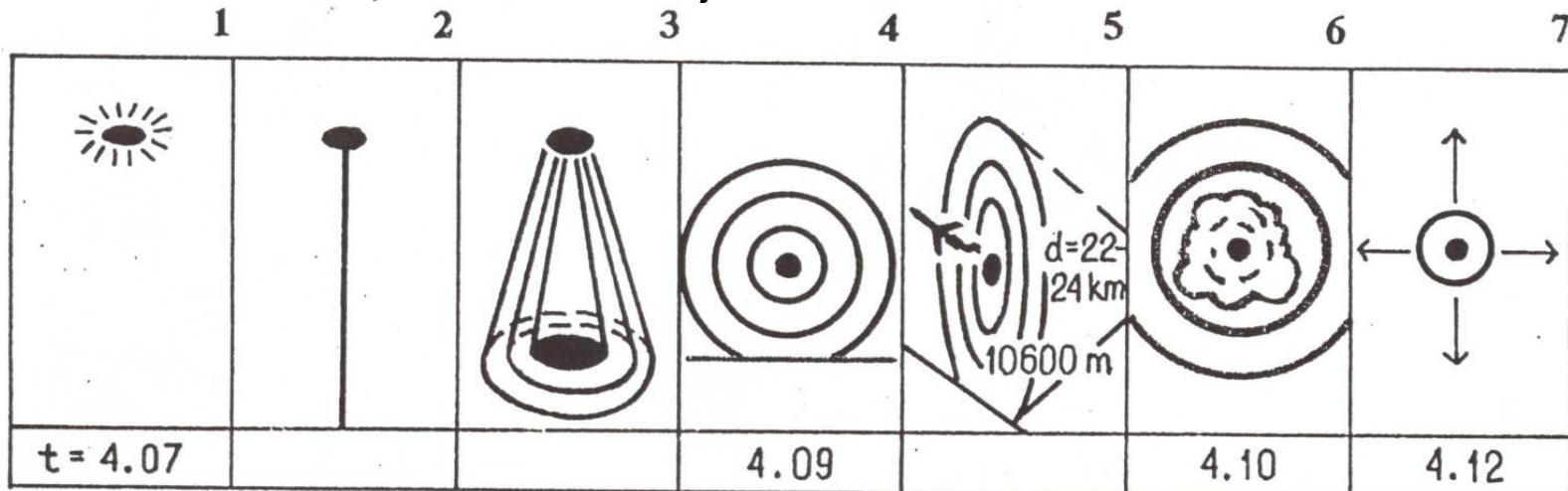
для наблюдателя в г. Северодвинске

для наблюдателя в г. Уфе

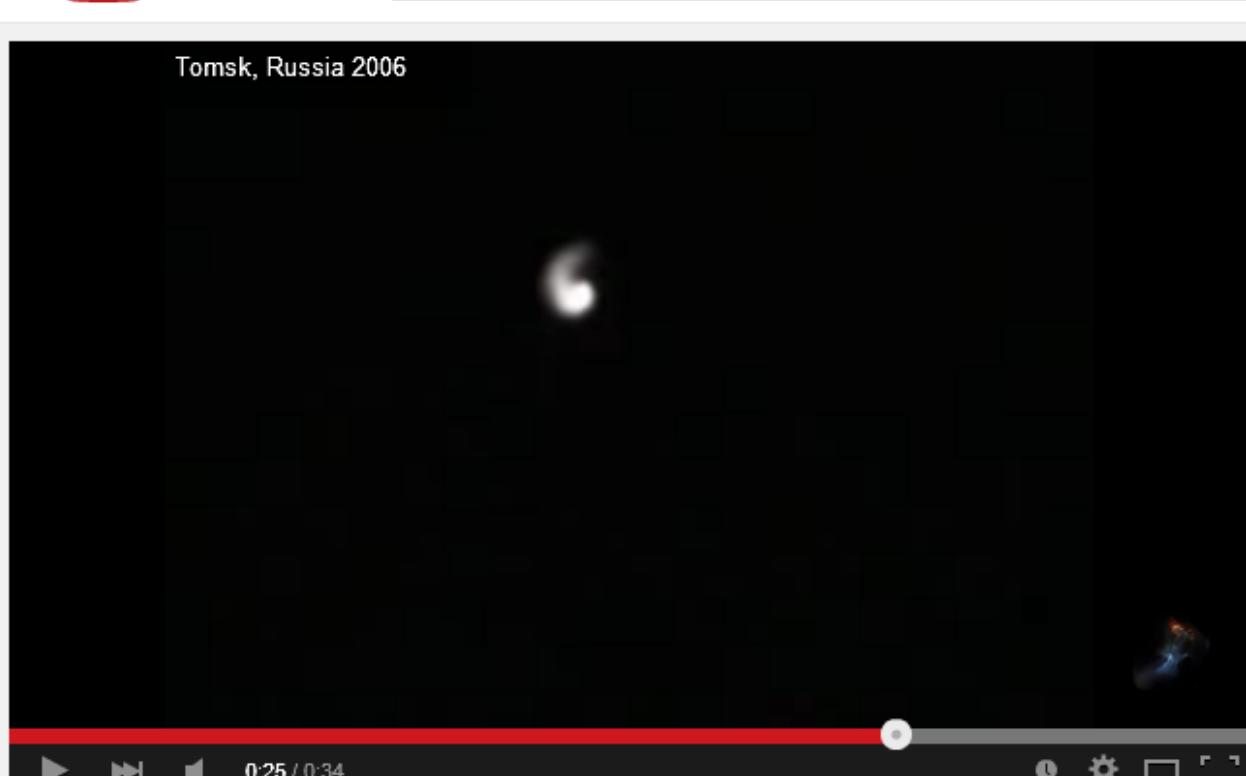
для наблюдателя в г. Архангельске



AIRLINER COPILOT'S LOGBOOK OVER MINSK, SEPTEMBER 1984



Tomsk Spiral UFO [2006]



The Russian Spiral UFO LIGHT 2006

 The UFO Report

<https://www.youtube.com/watch?v=YG-3S2WKP6Y>

http://satobs.org/seesat_ref/misc/tomsk_spiral_ufo_2006.pdf

"FAT COMMA" CLOUD IS CHARACTERISTIC OF 'SOYUZ' VEHICLE LAUNCH, AFTER THE THIRD STAGE SHUTS DOWN AND PAYLOAD SEPARATES, STAGE INITIATES A SURPLUS LIQUID OXYGEN FUEL DUMP TO PUSH IT GENTLY AWAY FROM FREED PAYLOAD. NORMALLY THIS WILL OCCUR ABOUT 220 KILOMETERS HIGH & 1800 KILOMETERS DOWNRANGE OF THE LAUNCH SITE [EITHER BAIKONUR/PLESETSK]

Meridian-5 third stage explosion [2011]



FULL REPORT <http://satobs.org/seesat/Oct-2016/0094.html>

FREQUENTLY ASKED QUESTION 10.

What was so unusual
about THIS launch?

Unusual factors

- Twilight illumination is uncommon – seems random
- Bulava ICBM program is most troubled Russian missile development effort in half a century
- Failure occurred late in ascent
- Failure of third stage involved either
 - -- loss of attitude control and tumbling
 - -- partial rupture of propellant casing wall
 - -- premature activation of thrust vents
- Consequently the malfunction was high enough for its consequences to remain visible for minutes

FREQUENTLY ASKED QUESTION 11.

How could it appear
again the next day over
Russia?

It didn't – another missile program

- Sometimes different missile tests that rely on common tracking facilities are timed close together to keep special deployed teams on station.
- The December 10 launch [announced in Moscow] was part of a program to test maneuverable warheads to evade US missile defense system
- Launch from Kapustin Yar [lower Volga] to Sary Shagan [Kazakhstan] was right over observation points just after sunset

Typical Topol ICBM from Kapustin Yar [diving on ABM radar test range]



- Usually post-sunset twilight
- Third stage burn canted slightly down
- Warhead deploy spinup
- Multiple flights
- Observed in Russia, central Asia, Middle East, and once by astronauts on space station

KY-SS family of Topol launches

[KYSST]

13 launches in ten years, half at twilight, so visible

- #3 -- 2009 Dec 10 1235 gmt +3 [sunset + 34m] SW Siberia
- #5 -- 2012 Jun 07 1739 gmt +4 [sunset + 43m] Mideast
- #6 -- 2013 Oct 10 1339 gmt +4 [sunset - 39m] Urals +ISS
- #9 -- 2014 May 20 1708 gmt +4 [sunset + 31m] Urals
- #11 -- 2015 Aug 22 1513 gmt +3 [sunset - 45m] Volga
- #12 -- 2015 Nov 17 1212 gmt +3 [sunset – 64m] “Ikea”

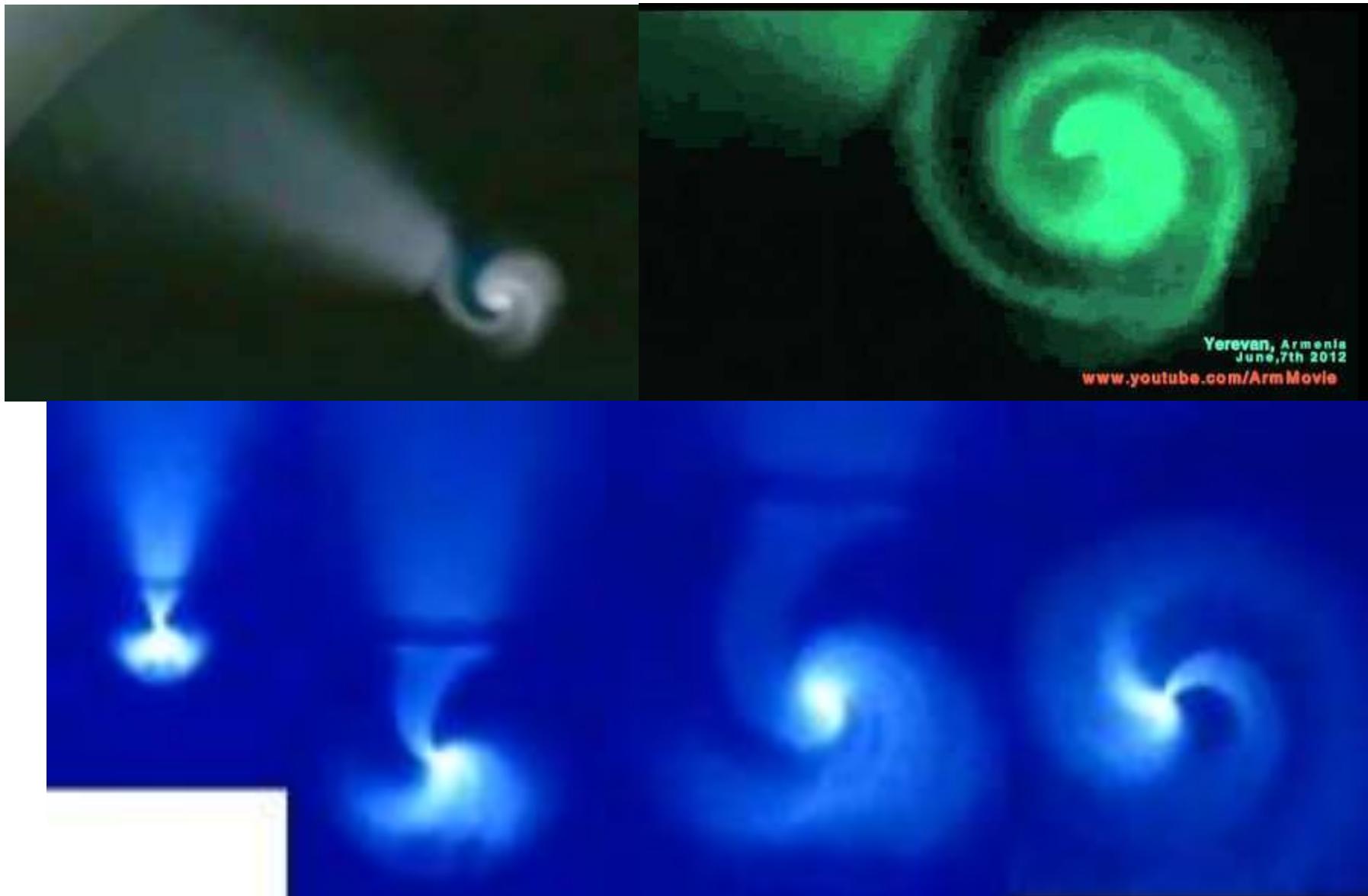
Short range test with high apogee [so are visible 1000+ kilometers off track]



<https://www.youtube.com/watch?v=QHUKyrEU7vc>

Topol warhead post-boost spinup

http://satobs.org/seesat_ref/misc/KYSS-12.pdf



Compare: MX warhead bus spinup

<http://www.youtube.com/watch?v=3wdjgL40wc4>



SPIN GAS GENERATORS FIR

FREQUENTLY ASKED QUESTION 12

How was it similar & dissimilar
to other missile tests?



<http://russiatrek.org/blog/photos/the-sky-views-during-space-rockets-launches/>

SIMILAR SHAPED ASCENT PLUMES

Sweden & Finland [1983] & space launch --
below about 100 km the vapor trail is twisted by fast crosswinds, then it broadens in the vacuum



Horizon view shows ascent plume



Four images of Tommy Guttormsen on Vardefjellet at Alta, showing launches final phase, between (approximately) 7:54 and a few minutes later. Canon EOS 450D with exposure times from 1 to 5 seconds.

Missile plume trail on eastern [dawn] horizon
shows typical zig-zag effect of crosswinds



© Tommy Guttormsen showing contrail viewed
from the Vardfjellet Mountains, Norway

FREQUENTLY ASKED QUESTION 13

Why can't so many
intelligent people believe
the missile explanation?

Main themes of disbelief

- 1 – Didn't look like any rocket ever seen before
- 2 – Appeared to float and defy gravity
- 3 – Expanding 'black hole' matched Hollywood SFX
- 4 – Rockets fall in flames when they fail
- 5 – Apparition was very close and in Norwegian airspace
- 6 – "Rocket" left no wreckage after exploding
- 7 -- Perfection of spiral form shows intent
- 8 – No sound of any explosion
- 9 – Glowing cloud implied unknown energy source
- 10 – Failing rockets zig-zag back and forth across the sky
- 11 – Failing rockets create bright fireballs, not black holes
- 12 – It stopped dead still in the sky and hung there

Comments on youtube videos

[https://www.youtube.com/watch?v=1hrWjkn_DHs]

- Agumonkk -- if it was a rocket, then how is it that the "exhaust trails" are in a PERFECT spiral? that thing has to be pretty far away, and that would mean that the spiral is HUGE. how can the exhaust from a rocket stay in a perfect spiral for that long? the wind surely would have dispersed it.
- Vladolenin --A missle? L.O.L. They DO think we're stupid. Missles dont grow into dark spheres that CONSUME LIGHT.
- ParkourSyah -- missile? it's impossible because missiles can't just spinning like that at the same spot and create a clean spiral, and how come the missile's smoke turns white into blue?
- phuckoff mmkay -- Bright blue circular light from a failed missile? They usually explode and fall down in a flaming fireball, wouldnt you say?
- ETPeace1 -- TruthSpreader1111 is right. this is obviously not a bulava missle. it's a ridiculous explanation. a missle spinning out of control could never make such perfect circles. also the circles stay in one place, they are not moving across the sky as a missle would. the black hole that emerges from the center cannot be explained by a missle. the cone of blue light cannot be explained by a missle. so it is clearly not a missle. the russians are lying on behalf of someone.
- Odin Thor -- no ufo no missile, lookup failed missil launches it goes BOOM not creating a spiral and then a black hole vanishing how stupid can people be?

Comments on youtube videos 2

- Sxr5a -- a Russian missile flies DIRECTLY over Norway, violating their airspace, and the Norweigians do not make a peep about it? Does this make sense?
- lookatmepleasesir: -- Sure anyone with two cents of wits and intelligence can line up the evidence and see that it's clearly a rocket.
- Firestrings272 -- The excuse of a rocket test is laughable, the reason being they cite no reference to any type of rocket capable of creating that effect and the Russian military itself didn't say it, in fact they've said nothing.
- Gordon1201 -- If this was a failed missile, and it self destroyed, wouldnt there have been some kind of flash at the end instead of a dark patch appearing in the spiral? also wouldnt there be some kind of wreck/debris left over however small it may be after self destruction?
- Poopdome56 -- its sad that there are still ignorant people out there that actually believe this is a rocket.
- Neo Lyssia -- rockets don't make perfectly symmetrical patterns nd stay in a perfect circle and then magically vanish tell me where did the rocket fall down at and explode ? how is the rocket glowing like an aura spiral ?
- 350ztech -- How stupid do they think people are? how can a perfect circle spining in mid air be a failed missle?
- TruthFeature -- That is NOT a rocket. It doesn't take a genius to realize that.

Comments on youtube videos 3

- The.PhantomPain -- that is not a missile i don't care what anyone says. the large hadron collider created a wormhole. it even behaves like a wormhole. it doesn't behave like a missile
- NassimHarameinVedas -- ANYONE who thinks this was caused by a "failed missile launch" is beyond brainwashed and retarded. Missiles have been launched since the 50's ok . . . and we've NEVER seen anything like this or heard about it.
- Hirmis -- if that was a missile, they had to hear some explosion.
- ProwlaMan -- What kind of failed missile launch would create such a well defined & well contained pattern such as a spiral????? These "Experts" really don't give the public much credit.
- Morbian13 -- it doesnt really make sense to me that a missile would cause a peculiar shape of beamed light such as a spiral, if it were wouldnt we see more of this occurrence?
- Steffyweffy777 -- not a missle. The spiralling theory would be correct if one was looking straight up the path of the missle, but from any other angle you would see a wavy line, not a spiral, and everyone who has taken video from far away at diverse angles, always gets the same perfect 2D looking spiral. The leading blue spiral doesn't line up with the missle trajectory either....this is a cover story...

Comments on youtube videos 4

- Agumonkk -- Failed rocket my a\$\$. how stupid do they think we are? even a 3 year old knows thats not even close to what a rocket does.
- 806TO713 -- Its funny how all of a sudden we have so many apparant "rocket engineers" commenting on this video. I think if any type of rocket could produce this type of effect then I would have learned about it in higschool or college during science class. And I'm dead serious, such a strange looking phenomenon would have been taught in some type of science class most high schoolers or even junior high students
- Marcus Christensen -- Also the spirals simply dont look like a spiraled out of control rocket. IF it had speed before it spiraled how then can it stop still, also why is the smoke trails lit up as if it was glowing.
- Sylph Viper -- That UFO was seen during NIGHT HOURS. And rocket fumes or exhaust DO NOT GLOW OR EMIT LIGHT. The missile theory is by far the most idiotic thing presented yet.
- Mattbellmay -- A rocket. thats a bit far fetched isnt it? I know that when something wierd like this happens and no explanation, that there are people who "create" explanations, but come on, couldnt they come up with something better then a failed rocket launch. To me a failed launch looks like a crazy rocket flying mindlessly in the sky then BOOM. Not a constantly perfect spiral that continues for a few minutes then fades away in some wierd black cloud thing. That is no "Out of control" failed rocket.

Comments on youtube videos 5

- WinduChi6 -- The other major problem for this being a rocket is, a rocket normally will be traveling at velocities in range of 1,000s mph. For anybody having knowledge of the dynamics of motion; a slight change in trajectory angle of a object traveling at several 1,000mph will generate enormous g-forces or centrifugal forces that will tear a rocket in to pieces, that will generate a, with combustive fuel on board, a explosive fire ball of bright orange-yellow-red color. So, the ICBM missile story is a LIE!
- Orrome -- the light was spiraling from the center - this could not possibly have been from a rocket as there are obvious spiral arms. If it was a rocket trail there would have been only one trail and it would not have been steadily moving outwards as this video shows. Your all fools.
- Treni217 -- If it really was a destructing rocket, wouldn't there be a fiery explosion? A real rocket blow up and there would be a ball of fire for at least a minute, but this particular thing turned into something like a black void. A real rocket wouldn't do that, and how WOULD it do that? Unless i'm stupid, I've NEVER seen a rocket "self-destruct" like this..... I think it WAS an UFO

QUESTION #14 -- Could astronauts on the International Space Station have seen it?

- Astronauts on the ISS **have** observed rocket launches
- Accidental observation of Russian ICBM
http://satobs.org/seesat_ref/misc/Russian_Missile_Launch_Viewed_from_ISS_2013.pdf
- Accidental observation of Russian satellite
http://www.jamesoberg.com/ISS_crew_spots_second_russian_rocket_rev_c.pdf
- Intentional observation of Soyuz crew launch
http://satobs.org/seesat_ref/misc/Soyuz_launch_4.pdf
- Splendid observation capability with multi-windowed ‘cupola’ module began with installation in February 2010 -- two months AFTER ‘Norway spiral’
- For ‘Norway spiral’, station **just happened** to be over southwest Russia *well within line-of-sight of plume*. This was a remarkable coincidence.
- Crew [Jeff Williams and Maksim Surayev] was just waking up and not scheduled for observing [overworked during ‘skeleton crew’ phase]
- There is NO indication that either was looking out window to north of track [Such a view was possible from smaller windows in several modules]

Source: wolframalpha.com



6:45 am UTC | Wednesday,
December 9, 2009

location current geoIP location

Show DMS

Show 3D

Orthographic proj

MISSILE

INTERNATIONAL
SPACE STATION

WOULD HAVE
BEEN PERFECT
OBSERVATION
IF ANYONE HAD
BEEN AT ANY
DOWN-SUN
WINDOW

[FRONT L to R] Maksim Surayev and Jeff Williams welcome three new crewmen [Kotov, Creamer, Noguchi] In time for Christmas.

QUESTION # 15



Why are such spiral
apparitions appearing
all around the world?

CONFLUENCE OF DEVELOPMENTS

- Increasing missile and rocket activity by dozens of players [government & private]
- Shift to spaceflight practices involving more frequent deliberate venting and rotating
- Ubiquity of personal video recorders
- Worldwide web for instant global sharing

Illustrative Examples

- Soviet rocket fuel dumps over South America
http://www.debunker.com/texts/giant_ufo.html
- Soviet missile/space war games over Siberia
<http://www.jamesoberg.com/china-em-ufo-1982-draft-2.pdf>
- Chinese satellite launching to south over Australia
<https://www.youtube.com/watch?v=hmILzolG9aM>
- SpaceX Falcon booster venting over Australia
<http://blogs.discovermagazine.com/badastronomy/2010/06/05/oh-those-falcon-ufos/#.WDoA-Fxvy-c>
- Russian rocket 3rd stage explodes over Urals
http://satobs.org/seesat_ref/mis/meridian_crash_2011_draft.pdf
- Trident sub-launch test off San Diego
http://satobs.org/seesat_ref/mis/misperceiving_missiles.pdf
- Russian defense-evading missile warhead testing
http://satobs.org/seesat_ref/mis/KYSS-12.pdf



Exceptional optical phenomena observed during the operation of Russian launchers

Stanislav Kozlov^a, Sergey Nikolayshvili^b, Yulii Platov^c, Mikhail Silnikov^{d,e,*}, Vitaly Adushkin^a

^a Institute of Geosphere Dynamics RAS, Moscow, Russia

^b Fedorov Institute of Applied Geophysics, Moscow, Russia

^c Pushkov Institute of Terrestrial Magnetism, Ionosphere

^d Special Materials Corp., Saint-Petersburg, Russia

^e Peter the Great St. Petersburg Polytechnic University, S

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Large-scale dynamic optical phenomena associated with the operation of rocket engines in the upper atmosphere under favorable illumination and weather conditions can be observed over a very large area. At the phenomenon localization height of about 150 km, such phenomena can be observed at a distance of up to 1000 km and an elevation angle of more than 10 degrees. Taking into account the singularity of the phenomenon, the absence of sound and “space miracle” expectations in the form of a “real UFO”, it is not surprising that some of these events have received excessive attention [1]. Below are examples of these events.

This article represents an attempt to explain the optical phenomena of this type from the point of view of common methodological and theoretical positions.

PROPOSED TERM “COSMOSOL” FOR NEW PHENOMENON OF SPACE PLUMES

Separation of the rocket steps by means of squibs is accompanied by the formation of an approximately spherical cosmosol (from words “cosmos” (space) and “aerosol”) cloud, which may take the form of a “bagel”. At altitudes of $\leq 50\text{--}60$ km, lighting effects can be observed during the combustion of the separated rocket fragments in the atmosphere.

“ACTA ASTRONAUTICA” PAPER SUMMARY

6. Summary

An integrated analysis of the experimental data on the optical effects observed during launches of Russian carrier rockets from different sites (Plesetsk, Kapustin Yar, White Sea) and across different tracks showed that all of the data are consistent and can be explained on the basis of well-known theoretical conceptions. Note that the possibility of ground observations of optical phenomena connected with carrier rocket launches depends on the time of the day, the weather conditions on the “object – observer” line, the rocket flight height, and the distance from the observation point. These conditions impose constraints on the optical observation site choice. As both optical effects and atmospheric characteristics in the range of 100–200 km are of practical interest, it is appropriate to organize special coordinated observations of such effects using both ground and space resources. All of these observations can be of both application-oriented value and of purely scientific value.

EXAMPLES OF RECENT RUSSIAN PAPERS

- [1] Y.V. Platov, V.V. Rubtsov, *UFOs and Modern Science*, Nauka, Moscow, 1991.
- [2] S.A. Chernouss, Y.V. Platov, V.V. Alpatov, M.V. Uspensky, Optical phenomena due to rocket exhaust products in the atmosphere, *Geophysica* 48 (1–2) (2012) 65–79.
- [3] P. Dalin, V. Perminov, N. Pertsev, et al., Optical studies of rocket exhaust trails and artificial noctilucent clouds produced by Soyuz rocket launches, *J. Geophys. Res. Atmospheres* 118 (2013) 7850–7863.
- [4] H.C. Van de Hulst, *Light Scattering by Small Particles*, Wiley, New York, 1957.
- [5] Y.V. Platov, A.I. Semenov, B.P. Filippov, Condensation of water vapor and carbon dioxide in the jet exhausts of rocket engines: 1. Heterogeneous condensations of combustion products, *Geomagn. Aeron.* 54 (1) (2014) 104–108.
- [6] Y.V. Platov, S.A. Chernouss, V.V. Alpatov, Features of optical phenomena connected with launches, *Geomagn. Aeron.* 53 (2) (2013) 198–203.
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- [8] S.I. Kozlov, N.V. Smirnova, Approximate method for estimating the depletion of stratospheric ozone in the bow shock wave and the plume of the rocket engine, *Cosm. Res.* 33 (6) (1995) 630–632 (in Russian).
- [9] N.V. Smirnova, S.I. Kozlov, E.A. Kozik, Influence of launches of solid propellant missiles in the Earth's ionosphere, *Cosm. Res.* 33 (1) (1995) 98–106 (in Russian).
- [10] N.V. Smirnova, S.I. Kozlov, Impact solid and liquid fuel combustion products on mesospheric ozone, *Cosm. Res.* 35 (1) (1997) 43–46.
- [11] M.T. Dmitriev, Explosions in the atmosphere, *Aerospace* 3 (1979) 44–45 (in Russian).
- [12] Yu.V. Platov, B.A. Sokolov, Study of unidentified flying objects in the USSR. Bulletin of the Russian Academy of Sciences, , 70 (6) (2000) 507–523 (in Russian).
- [14] http://youtube.com/watch?v=q9TlyroKp_E.



CONCLUSIONS



1. Spectacular apparition observed in Norway on December 9, 2009 was created by a Russian sub-launched ICBM
2. Missile was following a standard test profile into Kamchatka
3. Weather was clear and plume was backlit by the pre-dawn sun
4. Anomaly during third stage caused object to wobble and spin
5. Spinning lasted unusually long but there had been a few earlier precedents [some photos & drawings, but no video]
6. Because of great distance, it was easy to misinterpret speed
7. These kinds of events will be occurring more frequently [and video recordings will be spread even wider] in years to come
8. Only by recognizing ‘new-normal’ prosaic stimuli will people be able to identify and isolate any truly anomalous phenomena

CREDITS

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