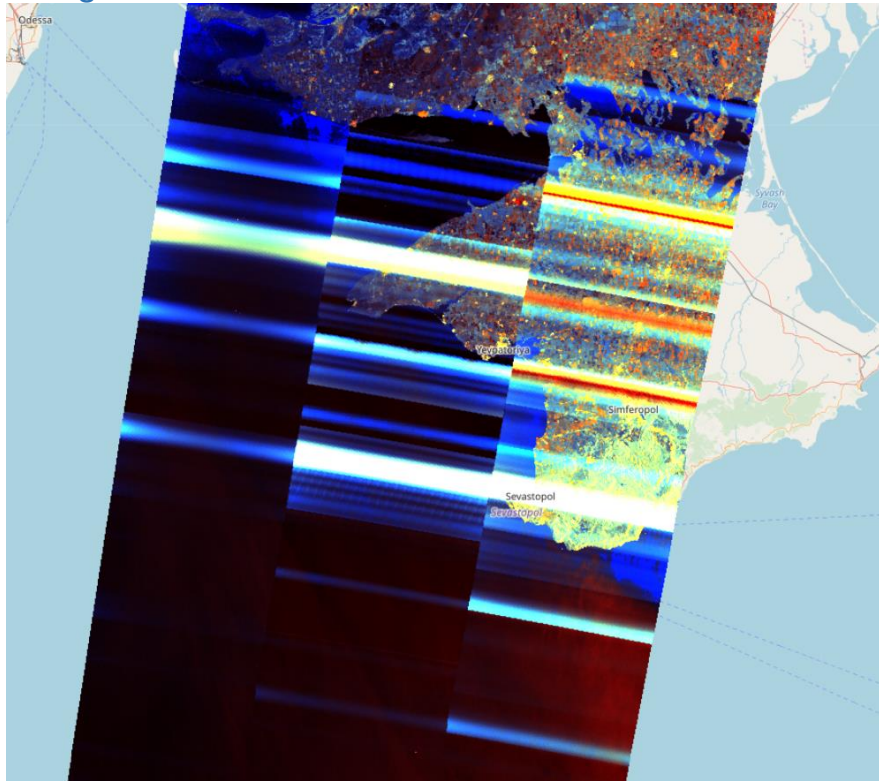


Radar jamming across the frontline in Russia and around Taiwan



Detection of the signals

During the last months, we have observed strong C-band radar signals along the frontline inside of Russia and the occupied Ukrainian territories, especially on occupied Crimea. The radar signals were detected with Sentinel-1 satellite images, which work in C-band (5.405 GHz).

Later on, on the 30th of March, we could see a similar signal northeast of Taiwan, where the signal must have been emitted from a ship given the location. Most probably, it is a Chinese military ship and part of the ongoing exercise around Taiwan.

We also see an overall increase in such signals, first they were spotted on Crimea only then they were visible on more and more sites.

C-band

While C-band is used for radar imaging, like the Sentinel-1 satellite, there are other applications working in the same frequencies:

- Radar Systems, e.g. air traffic control radar
- Fixed Wireless Broadband
- Microwave Links
- Wifi or 5G signals, can work in this frequency band
- Satellite communication often works in part of the broader C-band (4.0–8.0 GHz), which is particularly suitable for long-distance communication because it can penetrate the atmosphere and is less affected by weather conditions like rain.

Possible Explanations

We conclude that these signals are used to protect important areas, such as airfields, because we can measure where the emitter must be approximately and they are always somewhere near a valuable target. The question is just how exactly they are used for protection.

We can think of these scenarios:

1. Detection

The radar is used for detection, e.g. drone or missile detection. This seems not very likely, since we cannot observe such strong signals anywhere else in the world and radar detection of aircrafts is definitely done everywhere.

2. Jamming

More likely, due to the very powerful signal, it is used for jamming. Some missiles use radar to find their target, this can be prevented by saturating the signal, making the missile go “blind”.

And of course you can jam reconnaissance platforms, like satellites or drones, however they often work in X-band and not C-band, but the jamming could also appear in a wide range of frequencies. We do not know if these jammers appear in other bands as well, because we can only measure C-band with the Sentinel-1 satellite.

3. Communication (Fixed wireless broadband, microwave links or wifi)

Fixed wireless broadband systems, such as point-to-point communication links, often operate in the 5.4 GHz range. These systems are used to provide high-speed internet connections, especially in rural or underserved areas.

In microwave communication, the 5.4 GHz band can be used for both terrestrial microwave links and backhaul communication, where high-bandwidth, point-to-point connections are required.

Communication also seems less likely, because what we see here is massively more powerful in terms of amplitude than what such antennas (like 5G) typically have.

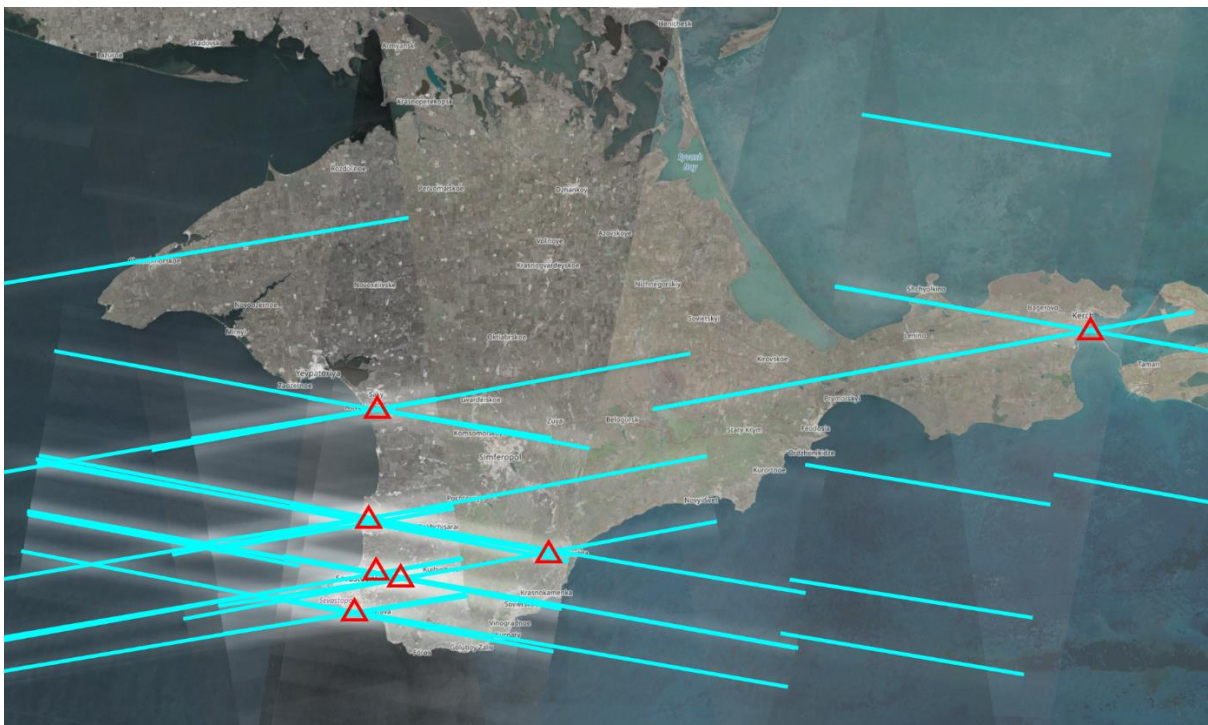
4. A combination of all

Locations

When analyzing the emitted signals, we can conclude that these EW systems must be at the following locations (where the signals intersect):

Crimea

Saky **airbase**, **Sevastopol** (likely 2 systems), the 15th coastal artillery near **Cape Fiolent** and one near the **Kerch Bridge**.



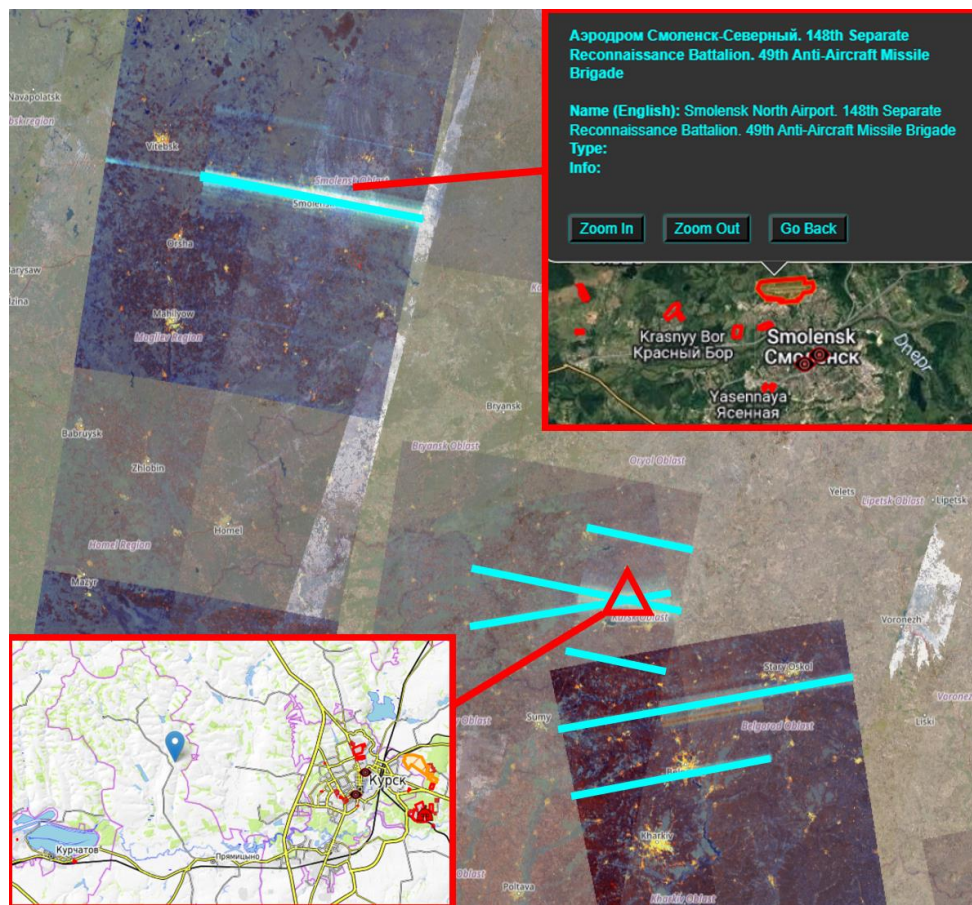


Russia

We can also find these signals along other war-important parts of Russia, namely near St. Petersburg, Smolensk, Kursk and east from the sea of Azov and more precise **Levashovo airbase** and **St. Petersburg international airport**,



Smolensk north airport, somewhere in the open west of Kursk city,



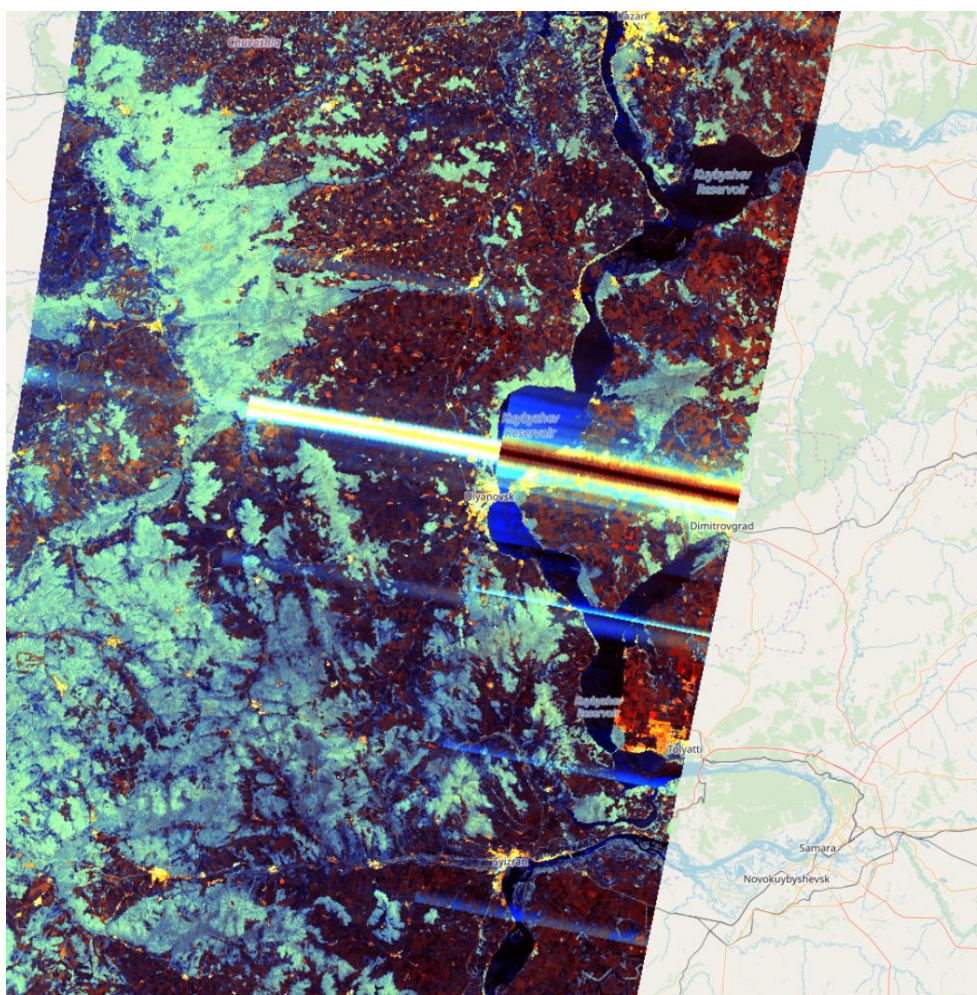
the separate **Electronic Warfare Center No.1270 Rostov**, **Primorsko** airbase and **Krymsk** airbase.



Moscow near **Chkalovsky military** airbase,



and somewhere near **Ulyanovsk**, probably at the nearby airbase.



Taiwan

We are starting to see the same radar jamming signals in the sea around Taiwan as we did in Russia. As stated before, the signal must be emitted from a ship given the location. Most probably, it is a Chinese military ship and part of the ongoing exercise around Taiwan.

