

# NATIONAL REPORT OF SWEDEN

Tina Kempe, Kibrom Ebuy Abraha, Lotti Jivall, Tong Ning, Chrishan Puwakkitiya Gedara et al.

Lantmäteriet, Geodata Division, Department of Geodetic Infrastructure, SE-801 82 Gävle, Sweden.  
E-mail: christina.kempe@lm.se

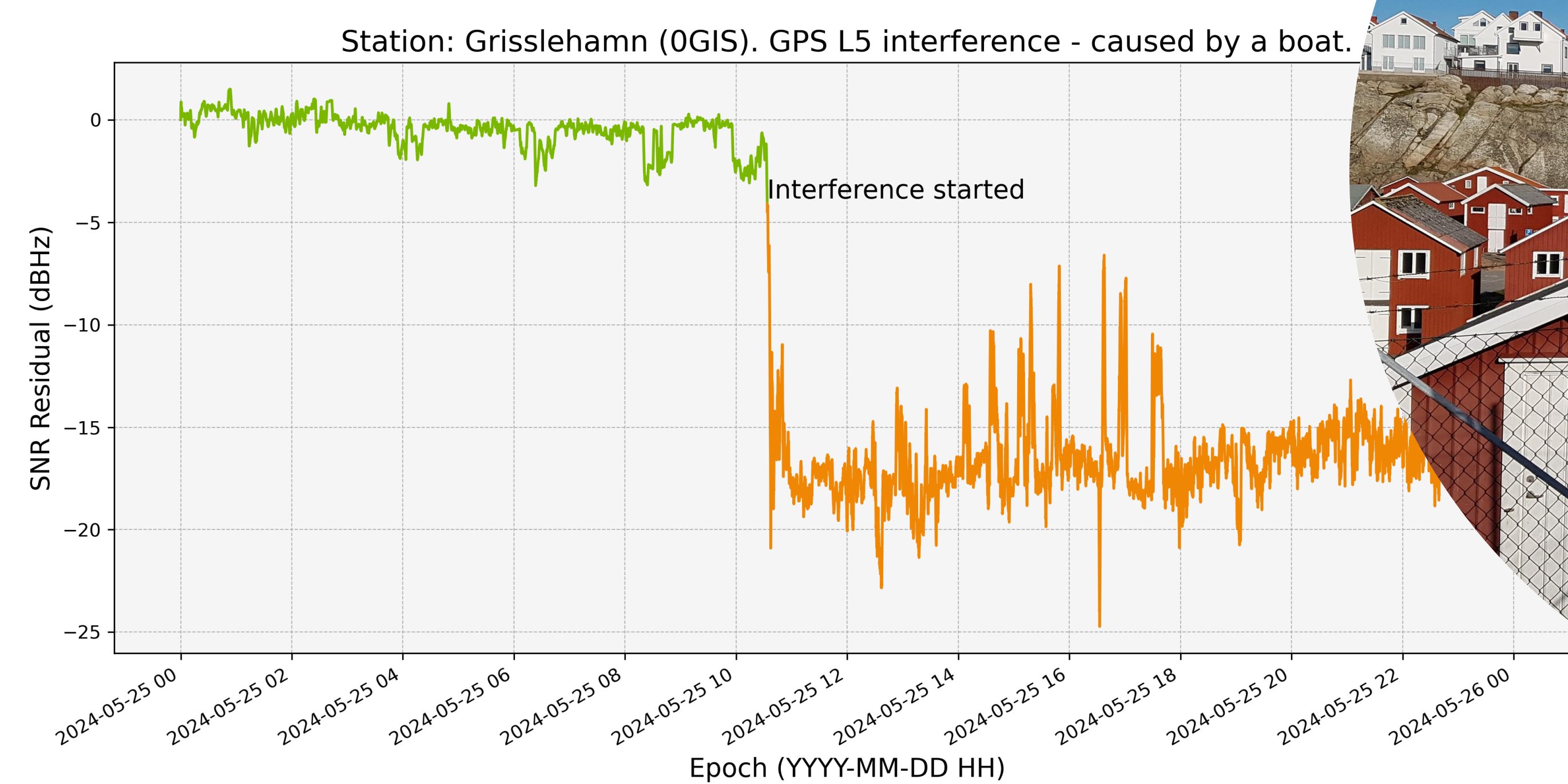
A comprehensive national report will be published at EUREF's website

## Improvement of the GNSS Interference Monitoring System

At SWEPOS, various activities are conducted to ensure the quality and reliability of GNSS data. Last year, we reported on the newly developed system for detection of disturbances in GNSS signals in near real-time.

Disturbances in SWEPOS data from various sources have been detected and investigated. However, no significant interferences for the SWEPOS Network RTK service were detected, but only on single stations that can be deactivated from the service.

We plan to improve the detection algorithm by considering more parameters and enabling real-time monitoring. A disturbance status information website will be launched, and the information will also be made available via an API. The goal is to contribute to the protection of critical GNSS and GNSS-dependent infrastructures against emerging threats.



The graph shows how the signal-to-noise ratio residuals of GPS L5 changed at the Grisslehamn station when it was interfered by something onboard a boat.

## SWEPOS Post-processing Service 3.0

The SWEPOS Post-processing Service is an e-service for high-precision coordinate estimation using the Bernese GNSS software. The user submits a RINEX file containing static GNSS observations and nearby SWEPOS stations are selected as reference points. The estimated coordinates are then e-mailed to the user.

Originally built in the early 2000s, the service has now been completely rebuilt and upgraded. With the upgrade, the service

- can process Galileo data, in addition to GPS and Glonass data, and supports all versions of the RINEX format
- features an improved quality check of user input data with detailed warning or error messages, to prevent incomplete RINEX files from proceeding to Bernese processing
- takes station geometry into account when selecting reference stations.

A new service – SweposQC – has also been added, to provide a comprehensive RINEX data quality report.

## Update of SWEPOS Ionosphere Monitor

With the upcoming solar cycle maximum, there is a need to improve the SWEPOS Ionosphere Monitor. Desired improvements include

- increased spatial resolution
- support for GNSS constellations other than GPS
- improved cycle slip detection and repair
- access service via an API, in addition to a website presentation.



The spatial variability of the ionosphere can significantly impact the performance of network RTK positioning. Network RTK relies on estimating atmospheric effects at the user's location, and larger ionospheric variability can lead to greater discrepancies between real and ted conditions.

The planned upgrade of the ionosphere monitor prioritizes assessing these ionospheric variabilities.

## Implementation of BSCD2000 – Baltic Sea Chart Datum 2000

Sjöfartsverket, the Swedish Maritime Administration, has begun implementing BSCD2000 in Swedish charts to achieve a uniform reference level.

Traditionally, the height reference level of nautical charts has been the mean sea level at the year of the chart's production. However, Fennoscandian post-glacial land uplift has resulted in numerous different reference levels being used in Swedish charts.

The transition to BSCD2000 as the reference level has been applied to most charts along the coast from the Gulf of Bothnia to the Stockholm archipelago.

The BSCD2000 reference level coincides with RH 2000, the Swedish national height reference frame, and is also close to the current mean sea level of the Baltic.

