

Ionospheric scintillation observations with Baldy (PL 612) LOFAR station

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It is widely-known that ionospheric plasma is a highly disturbant medium for extra-terrestrial electromagnetic emissions in the range of the radio waves. The level of plasma-originated disturbances grows with the signals wavelength. Although the Global Satellite Navigation Systems (GNSS) were designed in a way that limits the degradational impact of the ionosphere, there are scientific purposes that are far more sensitive to it. One of them is radio astronomy – especially when considering low frequency facilities (such as LOw Frequency ARray – LOFAR Telescope). By inverting this problem, radio telescopes become very promising instruments in ionospheric studies.

The LOFAR system operates in the range of 10-240. Space weather analyzes – including ionospheric studies – are one of the LOFAR Key Science Projects. Baldy (PL 612) station managed by University of Warmia and Mazury routinely observes ionospheric scintillations in its local mode since founding in 2015.

Hereby we present some ionospheric scintillation dynamic spectra. For comaprison we present traditional GNSS-based ionospheric fluctuations studying techniques to search for potential synergies in analyzes in different areas of the radio spectrum.