

## **Structure and temporal variation of ionosphere derived from LOFAR calibration routine**

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One of the key issues determining the quality of radio astronomy observations in the low frequency regime is the influence of ionosphere exerted on transmitted electromagnetic signals. Proper removal of ionospheric effect is especially important for retrieving faint signals, such as the 21 cm redshifted emission line of neutral hydrogen from the Epoch of Reionization, being the focus of the EoR project conducted with the aim of the LOw Frequency ARray (LOFAR) interferometer. In this study we analyze ionospheric calibration solutions calculated routinely as a part of the aforementioned project, covering many hours of winter nighttime observations (each observation lasting 6-8 hours) in the HBA frequency range (110-250 MHz). We obtain differential Total Electron Content values between LOFAR network stations restricted to the core and remote stations located in Netherlands, which give information on horizontal TEC gradients and structures existing in ionosphere. High temporal and spatial resolution, as well as long timespan of observations gives us insight into morphology and dynamics of this ionized layer with respect to different geomagnetic conditions. This in turn may lead not only to better understanding of various processes taking place in ionosphere, but also to improvement of calibration technique itself and therefore sensitivity of radio astronomy observations at low frequencies.