



LOFAR4SpaceWeather: Towards space Weather Monitoring with Europe's Largest Radio Telescope

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LOFAR is the worlds largest low frequency radio telescope, with a dense core in the Eastern part of the Netherlands and many stations distributed both in the Netherlands (with baselines reaching 100s of kms) and Europe wide (with baselines up to 2000 km). The existing infrastructure not only offers a great tool for a variety of radio astronomical observations, but the sensitivity and flexibility of the system also allows for dedicated space weather studies. The LOFAR instrument allows a comprehensive view on the Sun Earth system. This includes measurements of radio emission in the solar corona, solar wind measurements through back lighting with compact astronomical radio sources as well as ionospheric measurements. However, in order to fully exploit LOFAR's capabilities as a Space Weather instrument, continuous real time monitoring of space weather events with the system is necessary. In the current set up this conflicts with the main use of the instrument as radio astronomical telescope.

LOFAR4SW is a design study, awarded a grant under the Horizon2020 INFRADEV call, to commence investigations into upgrading LOFAR to enable regular Space Weather monitoring in parallel with radio astronomy operations. In this presentation we will summarize the aims and discuss the current status of the LOFAR4SW design study and provide an outlook to the space weather science and monitoring capabilities a fully integrated system would enable.