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LOFAR new tool for Space Weather Program

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LOFAR is the Low-Frequency Array, exploring yet poorly studied range between 30-240 MHz frequencies. It constitutes a European array of thousands of antennas - a challenge for data transfer and processing techniques. The project is based on an interferometry array of radio telescopes using about thousand small antennas concentrated in at least 52 larger stations, 40 of these stations are distributed across the Netherlands, six stations in Germany, 3 in Poland and one each in Great Britain, France and Sweden. The data processing is performed by a Blue Gene/P supercomputer situated in the Netherlands at the University of Groningen.

Novel ground based wide area sensor networks, such as the LOFAR (Low Frequency Array) radar facility, comprising wide band, and vector sensing radio receivers and multi-spacecraft plasma diagnostics should help solve outstanding problems of space physics and describe long-term environmental changes.
The three new LOFAR stations were installed during 2015 in Poland. The LOFAR facilities in Poland are distributed among three sites: Borówiec near Poznan, Bałdy near Olsztyn and Łazy near Krakow. All they are connected via PIONIER dedicated links to Poznan.

The frequency range of LOFAR (10-250 MHz) is a very important for the cosmic plasma physics. In this spectral domain we can observe for a first time the regions of normal and radio galaxies yet unseen at higher frequencies: their radio flux rapidly fades with frequency because of ageing population of high-energy relativistic electrons. This is also the optimum domain for observing the radio emission from magnetospheres of pulsars and giant (solar or extrasolar) planets. LOFAR will also give us chance for monitoring and diagnostic of different processes in space plasma enviroment of the Earth‘s and rado emissions from Sun. All this provides a trip to yet unexplored domains of the Universe and can be the exelent tool for SSA and Space Weather program