



LOFAR Single Station as a Training Tool for Students

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The LOFAR (Low-Frequency Array) radio telescope is relatively new instrument, arranged as an interferometer, composed currently of 51 stations located in many parts of Europe [1]. Each station consist of up to 3264 omnidirectional dipole antennas (in full configuration) and is able to observe radio waves from the sky in range of 10 – 240 MHz (see Figure 1). Signals from individual dipoles, sampled with 200 MHz clock, after digitalizing process which takes place in the field generates up to 10 Gbits/s of raw data, which is served through a dedicated network for analyzer systems.

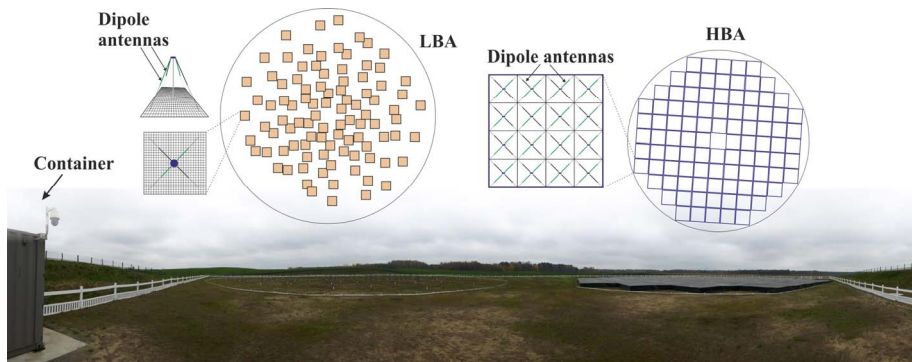


Figure 1. LOFAR Station in Bałdy, Poland.

Many of the stations, depending on the configuration, are used both in interferometric observations within the International LOFAR Telescope as well as individually in a local mode. In this presentation we want to show how important this instrument can be for educational purposes and how a wide range of topics can be implemented. The single mode of LOFAR station (in particular, the authors think of station in Bałdy) in addition to strictly scientific applications, which has already been described [2, 3], can be used in the process of student's teaching in several thematic areas as follow: i) phased array antennas, their configuration and principle of operation, ii) massive datasets online transmission and analysis, iii) radio astrophysical topics, particularly solar physics, space weather and pulsar observations.

LOFAR provides the students of engineering, IT, and science, a unique opportunity to join not only in the field of scientific research but to learn about many aspects of the work of modern radio astronomy equipment. Finally, it should be mentioned that LOFAR also has a powerful potential in the field of popularizing science, which in the case of PL612 and other stations is implemented through open days, demonstrations and public lectures.

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2. L. Błaszkwicz, W. Lewandowski, A. Krankowski, J. Kijak, O. Koralewska, and B. Dąbrowski, "Prospects for Scrutiny of Pulsars with Polish Part of LOFAR", *Acta Geophys.* **64**, vol. 1, 2016, pp 293-315, doi: 10.1515/acgeo-2015-0038.

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