



New low-frequency radio array for solar, planetary, galactic and extragalactic radio observations at Lustbuehel Observatory.

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The low frequency radio astronomy in Europe has developed very rapidly during the last decades. Several cutting edge modern facilities have been constructed and are now in operation. We plan to thoroughly upgrade the existing radio facility at Lustbühel Observatory at the eastern outskirts of Graz (Austria), by constructing a new generation high efficient phased radio array, L-GURT, which will be operated in the decametric frequency range. L-GURT sub-array is a basic part of the GURT (Giant Ukrainian Radio Telescope) radio telescope which is now under construction at UTR-2 radio Observatory near Kharkiv, Ukraine (Konovalenko et al., 2016).

L-GURT consists of 25 active dual polarized dipoles (5×5) and will cover a frequency range from 8 to 80 MHz with an effective area about 350 m² (at 40 MHz). The array will be operated in standalone mode. In spite of the relative small size, the telescope will be able to observe radio emission from the Sun, Jupiter and even signals from galactic and extragalactic radio sources. L-GURT telescope will be equipped with high-performance wave form receiver and digital spectrometer ADR (advanced digital receiver, Zakharenko et al., 2016) providing the observations with high temporal and spectral resolution (down to microseconds and 4.8 kHz resolution). ADR is designed for spectral analysis of a band up to 80 MHz, with high dynamic range and several operation modes including real time FFT, waveform recording, auto- and cross-correlation spectral measurements.

Our intention is not only to install the new antenna array, but to develop a state-of-the-art observational facility that will be exceptionally powerful in its own right while being capable of working in synergy with other radio telescopes and spacecraft missions. This requires the realization of the following tasks: 1) construction of the new phased antenna array; 2) performing precise antenna calibration; 3) real-time data analysis system using a pattern recognition technique.

1. Konovalenko, A., et al., “The modern radio astronomy network in Ukraine: UTR-2, URAN and GURT”, *Experimental Astronomy*, **42**, 11-48, 2016.

2. Zakharenko, V., et al., “Digital Receivers for Low-Frequency Radio Telescopes UTR-2, URAN, GURT”, *Journal of Astronomical Instrumentation*, **5**, 1641, 2016.