

The Tunka Radio Extension (Tunka-Rex): A new radio detector for cosmic ray air showers

Sunday, 8 September 2013 19:30 (0 minutes)

Tunka-Rex is a new radio detector for extensive air showers from cosmic rays, built in 2012 as an extension to Tunka-133. The latter is a non-imaging air-Cherenkov detector, located near lake Baikal, Siberia. With its 25 radio antennas, Tunka-Rex extends over 1-km^2 with a spacing of 200-m and therefore is expected to be sensitive to an primary energy range of $10^{17}\text{-}10^{18}\text{-eV}$. Using Trigger and DAQ from Tunka-133 this setup allows for a hybrid analysis with the air-Cherenkov and radio technique combined. The main goals of Tunka-Rex are to investigate the achievable precision in reconstruction of energy and composition of the primary cosmic rays by cross-calibrating to the well understood air-Cherenkov detector. While the focus in the first season was to understand the detector and develop frame conditions for future work, an early analysis already proves the detection of air-shower events with dependencies on energy and incoming direction as expected from a geomagnetic emission mechanism. Furthermore, in near future tests will be conducted for a joint operation of Tunka-Rex with Tunka-HiSCORE, a gamma ray observatory at the same site, and the upcoming scintillator extension of Tunka-133.

Primary author: Mr HILLER, Roman (Karlsruhe Institute of Technology)

Presenter: Mr HILLER, Roman (Karlsruhe Institute of Technology)