

Development self-trigger algorithms for radio detection of air-showers

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The detection of extensive air-showers with radio method is a relatively young, but promising branch in experimental astrophysics of ultrahigh energies. This method allows one to carry out observations regardless of weather conditions and time of day, and the precision of reconstruction of the properties of primary particles is comparable to the classical methods. The main disadvantage of this method is the complexity of the trigger implementation. Radio signals from extensive air-showers have a duration of few tens nanoseconds and amplitudes comparable to the surrounding background. Moreover, industrial noise, tele- and radio broadcasting signals, as well as noise from the electronic equipment of the experiment, often interfere with measurements. Most of the setups for detecting radio emission from extensive air-showers use an external trigger from optical or particle detectors. Despite numerous attempts to develop autonomous (operating with an internal trigger) cosmic ray radio detectors, there is still no established cost-effective technology for the sparse radio arrays. We give an overview of our progress in this direction, particularly describe noise generator and simulation study using data from Tunka-Rex Virtual Observatory.

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