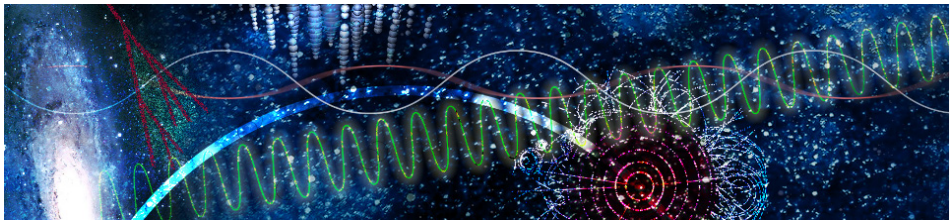

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Radio Detection of Ultra-High Energy Cosmic Rays and Neutrinos with GRAND

Ultra-high energy (UHE) cosmic rays and neutrinos induce so-called particle air-showers as they interact with the Earth's atmosphere or crust. Radio detection of air-showers has proven to be very advantageous for the measurement of UHE cosmic rays. As a consequence, a new generation of experiments for radio detection at large scales is currently in development. The Giant Radio Array for Neutrino Detection (GRAND) will have a detection area of 200 000 km^2 once fully operational. This will provide unprecedented sensitivity for cosmic rays and neutrinos at the highest energies.
In order to reliably distinguish air-showers from transient noise for such large arrays, we develop an efficient and autonomous multi-level radio trigger*. For this purpose, we develop a detailed signal model of the radio emission using CORSIKA air-shower simulations. The signal model also enables event reconstruction for simulated air-showers and, eventually, real event data.
The trigger is composed of two levels. The first-level triggers on antenna signals according to expected signal shapes. The second-level trigger makes a final decision by combining information from the input of the signal model and from all antennas triggered during the same event.

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