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## R&D of EAS radio detection in China

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In order to study ultra-high-energy cosmic-ray (UHECR) sources, we need not only to know their direction, energy and chemical composition, but also large statistics of experimental data, which requires that the detector should have a large effective area and a high duty cycle. Radio antennas present some attractive aspects in this perspective, with very low unit costs, easiness of deployment over large areas and 100% duty cycle; they are therefore suitable for detecting UHECRs.

In the Tianshan Mountain range (Xinjiang Autonomous Region, China), a radio-interferometer named 21 CMA was deployed, which aims at studying the epoch of reionization by detecting the hydrogen 21 cm radiation. On this site, the Sino-French cooperation experiment TREND (Tianshan Radio Experiment for Neutrino Detection) has performed autonomous detection and identification of EAS with a stand-alone and self-triggered array of 50 radio antennas. This inspires us to investigate the polarization characteristics of the radio signal with a hybrid array of 21 scintillators and 35 antennas measuring the x, y and z components of the electric field emitted by air showers. This hybrid setup is expected to provide a quantitative evaluation of the EAS identification & background rejection of the radio technique. If successful, this experiment would open the door for stand-alone, giant radio arrays dedicated to the study of high energy cosmic particles, such as the GRAND project.

### Collaboration

– not specified –

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