

Radio antennas to detect high-energy Gammas, Neutrinos, Cosmic Rays

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The radio detection technique is successfully used for the measurement of air showers initiated by charged cosmic rays. So far, this is applicable to cosmic ray primaries with energies above 40 PeV. An extension of this detection method can be made for the observation of air showers originating from neutrinos and gamma rays of high energy. Recent results from a simulation study performed for the IceTop radio enhancement, at the South Pole, shows that it is possible to lower the radio-detection threshold down to a PeV. This allows for the detection of gamma rays of the highest energy using the radio technique. It is also possible to measure air showers that originate from earth-skimming tau neutrinos by measuring their radio signals. Upcoming experiments like GRAND focus on the measurement of these air showers using a large-scale radio array installed on mountain ranges. The radio detection technique therefore is a promising method to observe these three messengers of the Universe in a consistent manner. An overview of this will be shown.

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