

Simulation of radio signals from air showers measured by in-ice radio antennas [Time: 10+3]

Thursday, 8 April 2021 11:01 (13 minutes)

We give an overview of the current state of the simulation of radio signals from air showers measured by in-ice radio antennas. We start with a short summary about the propagation of in-air radio emission into ice, and then focus on the propagation of the particle shower itself through ice. The Corsika Monte Carlo code was used to simulate the in-air part of air showers, which was combined with the Geant4 simulation toolkit for its propagation through ice. We discuss the general features of the in-ice particle cascade and give a parameterization of both the longitudinal particle development as well as the lateral cascade front distribution. We conclude air-shower induced in-ice particle cascades are very similar to neutrino induced in-ice particle cascades, indicating that air showers could serve as an in-situ calibration source for neutrino observatories. We show first Monte Carlo estimates of the expected radio signal coming from this in-ice particle cascades. Finally, we give a short status update on Corsika 8, which aims to include the simulation of radio signals from air showers measured by in-ice radio antennas.

Primary authors: DE KOCKERE, Simon (Vrije Universiteit Brussel); DE VRIES, Krijn (Vrije Universiteit Brussel); HUEGE, Tim (Karlsruhe Institute of Technology); LATIF, Uzair (University of Kansas); VAN EIJNDHOVEN, Nick (Vrije Universiteit Brussel)

Presenter: DE KOCKERE, Simon (Vrije Universiteit Brussel)

Session Classification: Radio