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Radar Echo Signals for RET-CR

The goal of the Radar Echo Telescope (RET) collaboration is to detect ultra-high-energy neutrinos via in-ice radar techniques. To this end, the RET collaboration has been aiming to demonstrate the radar echo method in-situ with the Radar Echo Telescope for Cosmic Rays (RET-CR) experiment, located in Greenland. RET-CR utilised secondary in-ice particle cascades - generated by high-energy cosmic ray air showers impacting the ice surface - as a test beam for the radar method. In this work, radar signals within a RET-CR detector configuration have been simulated using the semi-analytic simulation package MARES. Relevant geometries to the RET-CR experiment have then been explored, and the effects of different radar echo features on signal observables - including amplitude and frequency - have been characterised and linked to properties of the progenitor cosmic rays.

Collaboration(s)

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