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Simulating Radar Echo Detection of High-Energy Particle Cascades with FDTD Methods CADE SBROCCO, STEVEN PROHIRA, Ohio State Univ - Columbus — Experiment T-576, performed at the SLAC National Accelerator Laboratory, investigated the technique of using radar to detect high-energy particle cascades. This was done by directing high energy electrons from a linear accelerator into a high-density polyethylene target and reflecting radio waves off the ionization left in the wake of the resulting cascade. The goal of the experiment was to validate a new ultra-high energy neutrino detection technique. We present here a Finite Difference Time Domain (FDTD) simulation that was developed to validate T-576 using the commercial EM solver software XFdtd. The primary features of the experiment (the target, plasma, and antennas) were implemented directly into the simulation, which returns a clear signal in good agreement with the results of the T-576 experiment and theoretical expectations. In this talk, T-576 will be briefly introduced before we detail the FDTD simulation, assumptions, validation, and results.

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