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Near-field effects in radio-frequency emission from particle showers in a dense medium RACHEL HYNEMAN, William & Mary Coll, STEPHANIE WISSEL, University of California Los Angeles, KONSTANTIN BELOV, NASA JPL, PATRICIA VAHLE, William & Mary Coll, DAVID SALZBERG, University of California Los Angeles, ANDRES ROMERO-WOLF, NASA JPL, SLAC T-510 COLLABORATION — Two mechanisms are expected to produce radio-frequency emission in ultra-high energy cosmic ray air showers. Askaryan emission, generated by an overall charge excess, has been studied in beam experiments previously. The emission due to Earth's magnetic field has been inferred from observations by cosmic-ray observatories, but not yet studied in a controlled laboratory environment. The SLAC T-510 experiment recently studied the effects of a magnetic field upon the radio-frequency emission from particle showers in high-density polyethylene as a way to model cosmic ray air showers. Ultra-High Frequency (UHF) and Very High Frequency (VHF) antennas were used to measure the signal from particle showers in the target at different positions. For an overview, see the talk by K. Mulrey in this conference. Several near-field runs were performed with the UHF antenna array closer to the target than in the majority of the data taking. Signal from the two mechanisms, Askaryan and Magnetic, were separated into orthogonal polarizations by the geometry of the system. We report on studies of the electric field for several positions in the near field. Initial results indicate that the electric field as a function of angle behaves consistently as the antennas are moved further from the target.

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