

Abstract Submitted
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First Results from the Telescope Array RAdar (TARA) Detector¹

ISAAC MYERS, University of Utah, TARA (TELESCOPE ARRAY RADAR) COLLABORATION, TELESCOPE ARRAY COLLABORATION — The TARA cosmic ray detector has been in operation for about a year and a half. This bi-static radar detector was designed with the goal of detecting cosmic rays in coincidence with Telescope Array (TA). A new high power (25 kW, 5 MW effective radiated power) transmitter and antenna array and 250 MHz FPGA-based DAQ have been operational since August 2013. The eight-Yagi antenna array broadcasts a 54.1 MHz tone across the TA surface detector array toward our receiver station 50 km away at the Long Ridge fluorescence detector. Receiving antennas feed an intelligent DAQ that self-adjusts to the fluctuating radio background and which employs a bank of matched filters that search in real-time for chirp radar echoes. Millions of triggers have been collected in this mode. A second mode is a forced trigger scheme that uses the trigger status of the fluorescence telescope. Of those triggers collected in FD-triggered mode, about 800 correspond with well-reconstructed TA events. I will describe recent advancements in calibrating key components in the transmitter and receiver RF chains and the analysis of FD-triggered data.

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