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The Telescope Array RADAR (TARA) Project and the Search for the Radar Signature of Cosmic Ray Induced Extensive Air Showers. STEVEN PROHIRA, Univ of Kansas, TARA COLLABORATION, TELESCOPE ARRAY COLLABORATION — The TARA (Telescope Array Radar) cosmic ray detector has been in operation since May 2013. It is the most ambitious effort to date to test an idea that originated in the 1940's: that ionization produced by cosmic ray extensive air showers should reflect electromagnetic radiation. The observation of this effect would open the possibility that remote-sensing radar technology could be used to detect and reconstruct extensive air showers, thus increasing the aperture available for the study of the highest-energy cosmic rays. TARA employs a bi-static radar configuration, consisting of a 25 kW, 5 MW ERP transmitter at 54.1 MHz broadcasting across the Telescope Array surface detector. 40 km distant, a set of log-periodic receiver antennas are read out by two independent data acquisition systems employing different techniques to select signals of the form expected for radar targets moving at close to the speed of light. In this talk, we describe the TARA detector and present the first quantitative limits on the radar cross-section of extensive air showers.

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