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Examining the Galaxy for Very High Energy (VHE) Gamma-Rays with VERITAS

VERITAS (Very Energetic Radiation Imaging Telescope Array System) is a highenergy gammaray telescope located at the Fred Lawrence Whipple Observatory in Arizona. Generally, the gamma rays detected by VERITAS have an energy greater than 100 GeV, which is approximately 100 billion times that of ordinary sunlight. A subject of interest for VERITAS is the origin and acceleration mechanism of cosmic rays, which are high energy protons and atomic nuclei. Cosmic rays are produced in the Universe, but their astrophysical sources are difficult to determine due to the magnetic fields in the galaxy that can alter the path of the cosmic ray before they bombard the Earth's atmosphere. Gamma rays, however, are photons, and their paths to the Earth remain unchanged as they traverse the galaxy. Of particular interest is the production of gamma rays via synchrotron radiation, typically seen in pulsars (which are rapidly rotating, highly magnetized neutron stars). Synchrotron radiation is produced when a charged particle accelerates at relativistic velocity in the vicinity of a magnetic field. This poster will present results from study of the pulsar tail PSR B0355+54, observed by VERITAS in 2010 and 2014. PSR B0355+54 is a pulsar tail, or the bow shock of a PWNe (Pulsar Wind Nebulae), which are formed when a highspeed pulsar escapes the dense SNR (Supernova Remnant) interior. Pulsar tails have not yet been seen at TeV energies, and a detection would have significant impact on our understanding. This work will present results using the Eventdisplay package with VERITAS, as well as the further research done on the Crab nebula in the fall, after the telescopes were turned off in the later summer.