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The VERITAS Observatory Upgrade: Performance and Status

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The VERITAS experiment measures Cherenkov light from air showers to study gamma rays of energies between 50 GeV and 50 TeV. During the summer of 2012, the VERITAS Collaboration completed an upgrade of the four VERITAS telescopes. The upgrade began in 2009 with the relocation of one of the telescopes to create a more symmetrical array configuration which resulted in a substantial increase in sensitivity. In 2011, the Level 2 (pattern) telescope trigger was replaced with a high speed, FPGA-based trigger, resulting in improved trigger efficiency and better background reduction. In summer 2012, the telescopes' photomultiplier tubes (PMTs) were replaced with high quantum efficiency PMTs which increased the telescope photon detection efficiency by approximately 50%. Furthermore, since fall 2012, observations have been carried out with VERITAS under bright moonlight, thanks to a combination of reduced high voltage and UV bandpass filters, which result in 15% more observing time over the course of the year. These improvements, coupled with refinements in the calibration and data analysis, have continued to improve the sensitivity of the VERITAS experiment since its first light in April 2007. In this presentation I will provide an overview of the upgrade as well as details of the bright moonlight observing modes.

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