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An indirect search for Dark Matter with a combined analysis of dwarf spheroidal galaxies from VERITAS

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Understanding the nature and identity of dark matter (DM) is a key goal in the physics community. Certain DM theories suggest that weakly interacting massive particles (WIMPs) may decay or annihilate into standard model particles with electromagnetic radiation up to very-high-energy (VHE) gamma-rays (greater than 100 GeV) produced in the process. The Very Energetic Radiation Imaging Telescope Array System (VERITAS) is an array of four imaging atmospheric Cherenkov telescopes (IACTs) that can indirectly detect VHE gamma rays in an energy range of 100 GeV to > 30 TeV. Dwarf spheroidal galaxies (dSphs) are ideal candidates in the search for WIMP DM due to their high dark matter content and their low gamma-ray fluxes from other processes. In comparison to the previous published VERITAS DM searches, this study uses a significantly larger dataset and employs improved analysis methods. In this contribution the results of the analysis of the extended VERITAS dSph data set and the resulting upper limits on the DM velocity-weighted cross section will be shown.

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