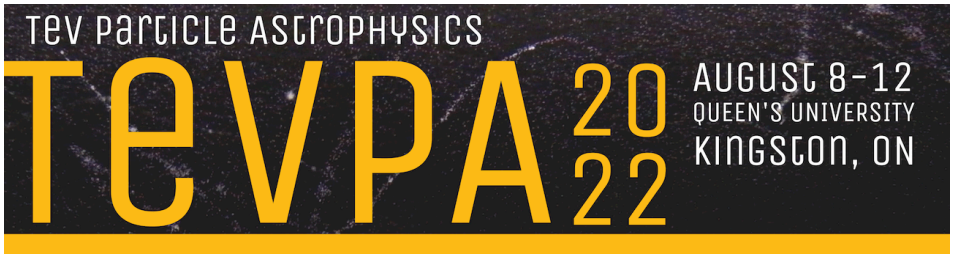


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# Combined dark matter searches towards dwarf spheroidal galaxies with Fermi-LAT, HAWC, H.E.S.S., MAGIC, and VERITAS

*Tuesday, August 9, 2022 2:20 PM (20 minutes)*

Cosmological and astrophysical observations suggest that 85% of the total matter of the Universe is made of Dark Matter (DM). However, its nature remains one of the most challenging and fundamental open questions of particle physics. Assuming particle DM, this exotic form of matter cannot consist of Standard Model (SM) particles. Many models have been developed to attempt unraveling the nature of DM such as Weakly Interacting Massive Particles (WIMPs), the most favored particle candidates. WIMP annihilations and decay could produce SM particles which in turn hadronize and decay to give SM secondaries such as high energy γ rays. In the framework of indirect DM search, observations of promising targets are used to search for signatures of DM annihilation. Among these, the dwarf spheroidal galaxies (dSphs) are commonly favored owing to their expected high DM content and negligible astrophysical background. In this work, we present the very first combination of 20 dSph observations, performed by the Fermi-LAT, HAWC, H.E.S.S., MAGIC, and VERITAS collaborations in order to maximize the sensitivity of DM searches and improve the current results. We use a joint maximum likelihood approach combining each experiment's individual analysis to derive more constraining upper limits on the WIMP DM self-annihilation cross-section as a function of DM particle mass. We present new DM constraints over the widest mass range ever reported, extending from 5 GeV to 100 TeV thanks to the combination of these five different γ-ray instruments.

## Collaboration name

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