Abstract Submitted
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Investigation of γ-ray Halos around Pulsars with HAWC[1] CHAD BRISBOIS, University of Maryland, College Park, MATTIA DI MAURO, NASA GSFC and CUA, ANDREW SMITH, University of Maryland, College Park, HAWC COLLABORATION — The discovery of a Halo around Geminga by Fermi-LAT confirmed HAWC observations of γ-rays produced by a large spatial distribution of electrons and positrons. Both HAWC and Fermi-LAT are uniquely positioned to perform unbiased views of the γ-ray sky, from >100 MeV to >100 TeV, which allows for investigation of energy-dependent lepton diffusion around pulsars. This helps us understand the contribution of positron excess from nearby pulsars, such as Geminga, which is measured by space-based instruments like AMS and PAMELA. Producing templates from simulated distributions of leptons and their transport, rather than phenomenological modeling, allows for a more fundamental understanding of the underlying physics by producing different templates depending on the effects taken into account. Because the γ-ray morphology of younger pulsars are expected to be more advectively dominated, rather than diffusively dominated for older pulsars, applying time-integrated templates can probe the question of when the Halo is established during the pulsars lifetime. This poster will focus on showcasing the template applied to HAWC data, with preliminary results for a select number of sources.

[1]https://www.hawc-observatory.org/support/

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