

Modeling globular clusters as multi-wavelength emitters

Thursday 16 September 2021 16:00 (25 minutes)

At present, only a single Globular Cluster (GC) has plausibly been detected at very high energies (VHEs) by H.E.S.S. The future CTA is expected to detect more GCs in this band. We present results from an emission code that assumes millisecond pulsars (MSPs) to be sources of relativistic particles diffusing through GCs that will give broad-band radiation due to their interaction with the cluster magnetic and soft-photon fields. We perform a parameter study to investigate the GC model's behaviour and study the detectability of Galactic GCs for H.E.S.S. and CTA. We also present new Fermi-LAT data on Terzan 5 and model its broadband spectrum, constraining our model with available multi-wavelength data. We furthermore derive constraints on the embedded population of MSPs' luminosity function. Finally, we note that stacking upper limits by H.E.S.S. on the γ -ray flux of a population of 15 Galactic GCs are very constraining for leptonic emission models. We therefore show that uncertainty in model parameters leads to a large spread in the predicted flux, and there are indeed regions in parameter space for which the stacking upper limits are satisfied.

Abstract field

Author: DAVIDS, Hambeleleni (University of Namibia, North-West University)

Co-authors: VENTER, Christo; VENTER, Christo (North-West University Potchefstroom Campus); BACKES, Michael (University of Namibia)

Presenter: DAVIDS, Hambeleleni (University of Namibia, North-West University)

Session Classification: Pulsars I

Track Classification: Pulsars