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# Modelling the Cumulative Spectrum Expected from a Population of Globular Clusters

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## Abstract content <br>   (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/a target="_blank">Formatting &<br>Special chars</a>

There are nearly 160 Galactic globular clusters (GCs) known. They consist of hundreds of thousands of stars held together by their mutual gravity. GCs are typically about ten gigayears old and are therefore expected to harbour many evolved stellar objects, since the latter should have had ample time to complete their evolutionary processes. The high stellar densities in the cores of GCs also enhance stellar encounter rates, facilitating the formation of objects such as low-mass X-ray binaries, cataclysmic variables, white dwarfs, and pulsars. Millisecond pulsars (MSPs) indeed occur abundantly in GCs: 28 of the Galactic GCs contain more than 144 confirmed radio pulsars, the bulk of these being MSPs. Such a population of cluster MSPs is expected to radiate several spectral components in the radio through gamma-ray waveband (e.g., involving synchrotron and inverse Compton emission), as have been seen by Chandra, Fermi, and H.E.S.S. in the case of Terzan 5 (with fewer spectral components seen for other GCs). H.E.S.S. has recently performed a stacked analysis involving 15 GCs and obtained quite constraining cumulative upper limits in the TeV band. We will present a model that assumes MSPs as sources of relativistic particles and predicts multi-wavelength emission from GCs. We will apply this model to the population of GCs mentioned above to predict an average cumulative spectrum with errors, and compare this to the H.E.S.S. upper limit. This should allow us to test whether the model is viable, and to constrain various ensemble-averaged cluster parameters within this framework.

## Apply to be<br> considered for a student <br>   award (Yes / No)?

No

## Level for award<br> (Hons, MSc, <br>   PhD)?

None

## Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

Yes

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