

ICRC conference 2021 - Executive summary

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What is this contribution about?

This contribution is about the characterisation of the gamma-ray emission from the HAWC source 3HWC J1928+178, using 1523 days of HAWC data above approximately 1 TeV.

Why is it interesting?

This source has been detected at TeV energies by the HAWC observatory. It has not been detected by any IACTs before that and has no counterpart in X-ray wavelength. Since its detection by HAWC, it has been confirmed by H.E.S.S.. The characteristics of this source and the underlying pulsar PSR J1928+1746, show that 3HWC J1928+178 may be a TeV halo, or in a transition phase to a TeV halo.

What have we done?

Using 3ML, we perform a multi-component fit of the region using a likelihood approach, to derive the best model of the region. We compare it with a model similar to the one used for the analysis of Geminga, assuming continuous injection of particles that diffuse away from the central source.

What is the result?

In the first case, the best model found with 3ML is composed of 4 components and 3HWC J1928+178 is represented by an extended Gaussian component of radius 0.27° (68% containment). In the second case, there are only 3 components and 3HWC J1928+178 has a size of 1.2° (68% of the TeV emission). The comparison of the two models using the BIC number favours the diffusion model. However, the spectrum derived for 3HWC J1928+178 from the 4 components model is in better agreement with previous results and with the recent LHAASO flux point.