

## Analysis of the Halo Candidate 1LHAASO J0359+5406 Based on LHAASO Observations

Due to significant improvements in observatory sensitivity, numerous halo-like sources have been identified. It appears that TeV halos commonly exist around powerful middle-aged pulsars. In this study, we present an observation of 1LHAASO J0359+5406 conducted by LHAASO. By applying a mask to the region above 1LHAASO J0359+5406, our fitting results reveal that it is an extended source with an extension of approximately 0.3 degrees, located at (RA=59.72 deg, Dec=54.18 deg), and exhibits a significance of TS=456.1. The spectrum displays a logparabola shape, characterized by a norm of  $4.54 \times 10^{-16} \text{ TeV}^{-1} \text{ cm}^{-2} \text{ s}^{-1}$ ,  $\alpha=2.72$ , and  $\beta=0.82$ . Through an examination of the extended model fixed at Pulsar J0359+5414 and B0355+54, we find contrasting evidence to that of the HAWC Collaboration, suggesting that 1LHAASO J0359+5406 is more likely to originate from Pulsar B0355+54 with a  $\Delta\text{TS}$  value of 10.8.

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