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### Revisiting the Galactic Center Gamma-ray Excess

The Fermi Large Area Telescope's detection of the Galactic center gamma-ray excess (GCE) in 2009 has puzzled researchers for over a decade. Two leading explanations for the GCE are a population of millisecond pulsars and dark matter annihilation. If the latter explanation is true, it will be the first evidence for dark matter interacts with the Standard Model particles beyond its gravitational influence. In this talk, I will describe our new approach to analyzing the GCE using a set of newly developed galactic diffuse gamma-ray emission (GDE) templates, calibrated with data from multi-messenger observations. Our results show that the GCE is approximately spherical and has a high-energy tail at higher significance than previously reported. These findings disfavor the millisecond pulsar interpretation of the GCE and suggest that it is more likely due to dark matter annihilation. We also compare our findings with results from another set of newly developed GDE templates, where the background gamma-ray emission is divided into cylindrical galactocentric rings with free independent normalizations. We find that the our approach works better and that the overall best fit is obtained for an astrophysically motivated fit when the GCE follows the morphology expected of dark matter annihilation. See arXiv: 2112.09706 and 2209.00006 for more details.