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**Dark matter or point sources? Utilizing the 1-pt PDF to understand the origin of the GeV excess seen by the Fermi LAT detector**  
NATALIE HARRISON, Univ of Chicago, JENNIFER GASKINS, University of Amsterdam, FERMI LAT COLLABORATION — An excess of gamma rays from the Inner Galaxy in the Fermi LAT data has been identified. This emission has been interpreted as a possible signature of the annihilation of dark matter particles, or as originating from a collection of unresolved point sources, such as gamma-ray millisecond pulsars. We explore the clustering properties of the diffuse emission arising from a population of gamma-ray point sources and from the annihilation of dark matter particles in the halo of the Galaxy using the 1-pt probability distribution function of counts in pixels (1pt-PDF, the number of pixels with a specified number of counts as a function of counts); this approach is also known as fluctuation analysis or P(D) analysis. We analyze the 1-pt PDF of the GeV excess within a +/- 5 degree box around the Galactic Center. For both dark matter and point sources we adopt the spatial distribution and spectrum to fit the GeV excess. We determine the contributions to the 1-pt PDF from the Galactic diffuse and isotropic diffuse emissions, dark matter, and point sources, and discuss the implications of this analysis for the origin of the GeV excess.

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