

Abstract Submitted  
for the APR17 Meeting of  
The American Physical Society

**Evidence for Spatial Variation in the High-Energy Spectrum of the Galactic Center Excess**<sup>1</sup> ANNA KWA, UC Irvine, SHUNSAKU HORIUCHI, Virginia Tech, MANOJ KAPLINGHAT, UC Irvine — Fermi Large Area Telescope observations towards the Milky Way center have revealed a spatially extended source of gamma rays in excess of the modeled astrophysical backgrounds. Possible explanations for this ‘galactic center excess’ include weakly-interacting massive particle dark matter annihilations, unresolved millisecond pulsars, and cosmic-ray outbursts from the galactic center. I will discuss an analysis comparing the the spatial morphology and spectrum of the excess signal in the innermost few degrees of the galactic center versus the outlying sky regions. We find that the excess spectrum above  $\sim 10$  GeV is spatially varying: the spectrum extends above these energies outside of  $\sim 5^\circ$  in galactocentric radius, but cuts off sharply by  $\sim 10$  GeV in the innermost few degrees. If interpreted as a real feature of the excess, this radial variation in the spectrum has important implications for both astrophysical and dark matter interpretations of the galactic center excess. Single-component dark matter annihilation models face challenges in reproducing this variation; on the other hand, a population of unresolved millisecond pulsars contributing both prompt and secondary inverse Compton emission may be able to explain the spectrum as well as its spatial dependency.

<sup>1</sup>supported by NSF GRFP Grant No. DGE-1321846

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Date submitted: 27 Sep 2016

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