Contribution ID: **11** Type: **not specified**

The TeV Cosmic-Ray Anisotropy from Local Dark Matter Annihilation

Wednesday, 21 May 2014 12:15 (25 minutes)

Several experiments including Milagro, IceCube, and HAWC have reported regions in the TeV sky with an excess of cosmic rays above the expected isotropic background. I will discuss the consistency of these cosmic-ray excesses with dark matter annihilations in a nearby subhalo. The dark matter explanation of the TeV cosmic-ray excess naturally explains both the spatial and spectral features of the TeV anisotropy. The dark matter annihilation rate and annihilation channels which explain the anisotropy also naturally explain the observed gamma-ray excess in the Galactic center as observed by HESS. I will demonstrate that the dark matter annihilation rate needed to produce the excess is consistent with current measurements of antiprotons, positrons, neutrinos, and gamma-rays. Additionally, I will discuss the predicted signatures from the dark matter subhalo in several cosmic-ray channels, several of which are measurable by the next generation of experiments.

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Session Classification: Particle Physics/Interactions/Astroparticle Physics