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A search for dark matter annihilation in nearby galaxy groups

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We perform a search for dark matter (DM) annihilation in nearby galaxies using 413 weeks of publicly-available Fermi Pass 8 gamma-ray data, utilizing a novel method that takes advantage of recently-developed galaxy group catalogs based on the 2MASS Redshift Survey. Having validated our method using N-body simulations, we construct nearly all-sky maps of an expected DM annihilation signal in the local ($z < 0.03$) universe and look for this structure in the Fermi data, probing theoretically well-motivated regions of parameter space for conservative assumptions about substructure enhancement. I will present the results of our analysis, discussing the effect of modeling uncertainty and implications for the DM interpretation of the Galactic Center excess.

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