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Astrophysical implications of Dark Matter interacting with baryons DIGVIJAY WADEKAR, GLENNYS FARRAR, Center for Cosmology and Particle Physics, New York University — It has recently been shown that a DM-baryon interaction cross-section around $\sim 10^{-25}\mathrm{cm}^2$ is compatible with direct detection limits for DM particles with a mass of $\sim$GeV. We report simple simulations of galaxies with a halo composed of such interacting DM particles. We study the implications of such interactions for the spatial and velocity distribution of the DM in our Galaxy. Simulations show that the extended DM halo is unaffected, but locally, the DM comes into quasi-co-rotation with the gas disk, potentially explaining correlated structure observed in gas and DM in rotation curves. DM-baryon collisions also heat the gas in galaxies and galaxy clusters, which can address long-standing astrophysical problems like star-formation quenching observed in galaxies and hot gas components observed in centers of galaxy clusters.

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