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Sensitivity of future-generation cosmic microwave background experiments to detecting dark matter-baryon interactions AIZHAN AKHMETZHANOVA, ZACK LI, Princeton University, VERA GLUSCEVIC, University of Southern California — In this work we investigate dark matter (DM) scattering with protons in the early Universe. We focus on velocity-dependent elastic scattering of DM particles with masses down to 100 MeV with protons. We forecast sensitivity of the next-generation cosmic microwave (CMB) background experiments to detecting DM-proton interactions using measurements of temperature, polarization, and lensing anisotropy. We find that they could deliver up to a factor of ~ 23 improvement in constraining the DM-proton scattering cross-sections which scale quadratically with the relative particle velocity, up to a factor of ~ 17 improvement for the cross-sections which have quartic dependence on the relative velocity, and up to a factor of ~ 53 improvement for the cross-sections of certain velocity-independent interactions.

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