

# Dark Plasma simulations

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We present the results of  $N$ -body/smoothed particle hydrodynamics simulations of galaxy cluster collisions with a two component model of dark matter, which is assumed to consist of a predominant non-interacting dark matter component and a 20\% mass fraction of dark plasma. Dark plasma is an intriguing form of interacting dark matter with an effective fluid-like behavior, which is well motivated by various theoretical particle physics models. We find that by choosing suitable simulation parameters, the observed distributions of dark matter in both the Bullet Cluster (1E 0657-558) and Abell 520 (MS 0451.5+0250) can be qualitatively reproduced. In particular, it is found that dark plasma forms an isolated mass clump in the Abell 520 system which cannot be explained by traditional models of dark matter, but has been detected in weak lensing observations. Main results presented in <http://arxiv.org/abs/1603.07324>

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