

Abstract Submitted  
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**Axion-photon conversion in the circumgalactic medium of a magnetized galaxy** PETR JAKUBCIK, ADRIANNE SLYZ, JULIEN DEVRIENDT, University of Oxford, SERGIO MARTIN-ALVAREZ, University of Cambridge, HORIZON-UK TEAM — In view of the observation of Type Ia supernova dimming, we focus on the conversion of photons to a cold dark matter candidate, the axion. This process was studied in the context of a high-resolution cosmological magnetohydrodynamical galaxy formation simulation. The strength of dimming was compared for the supernova's host galaxy, passage around another galaxy, and the intergalactic medium. Particular attention was paid to temporary magnification by local magnetic fields in the circumgalactic medium. Outflows of material during galaxy mergers are highly magnetized and ionized, both of which efficiently catalyze the axion-photon conversion. The obtained strength and prevalence of this effect hint at the viability of dimming in circumgalactic media as a detection mechanism for the axion.

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