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# The shadow of dark matter as a shadow of sting theory

We point out that the Kalb-Ramond field of string theory can help to generate a $U_Y(1)$ portal to dark matter. This entails the possibility that the $U_Y(1)$ gauge field is related to a fundamental vector field for open string interactions. The $U_Y(1)$ portal also implies dipole and fluorescent dark matter couplings of the form initially suggested by Profumo and Sigurdson [1], and used by Conlon et al. to explain the anomalies in the 3.5 keV data from Perseus. The requirement to explain the observed dark matter abundance relates the coupling scale M in the corresponding low-energy effective $U_Y(1)$ portal to the dark matter mass $m$. The corresponding electron recoil cross sections for a dipole coupled dark matter species are below the limits from XENON, SuperCDMS and SENSEI, but above the neutrino floor.

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