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Ultraviolet Completion of a Composite Asymmetric Dark Matter Model with a Dark Photon Portal

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Composite asymmetric dark matter scenarios naturally explain why the dark matter mass density is comparable with the visible matter mass density. Such scenarios generically require some entropy transfer mechanism below the composite scale; otherwise, their late-time cosmology is incompatible with observations. A tiny kinetic mixing between a dark photon and the visible photon is a promising example of the low-energy portal. In this talk, I will demonstrate that grand unifications in the dark and the visible sectors explain the origin of the tiny kinetic mixing. I will also show that the dark confinement scale can be similar as the visible hadronic scale in a mirror unification model. This talk is based on arXiv:1811.10232 and work in progress.

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