

KEK Theory Meeting on Particle Physics Phenomenology (KEK-PH2018 winter) and 3rd KIAS-NCTS-KEK workshop on Particle Physics Phenomenology

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Extended Dark Matter EFT

Tuesday, 4 December 2018 16:00 (15 minutes)

We present a new framework in the language of effective field theory (EFT) to describe Dark Matter and combine limits from experimental searches from nuclear ("Direct Detection") to LHC energies. To improve the high energy-validity of conventional DM EFTs we add a dynamical (pseudo-) scalar serving as mediator to the dark sector, represented by a fermion (or scalar), where richer new-physics sectors can be consistently included via higher-dimensional operators. The model is formulated in a gauge-invariant way and allows to confront classical Dark Matter observables with measurements of the Higgs sector. Interestingly the leading effects originate at dimension-five, allowing to capture them with a rather small set of parameters. We present constraints on the parameter space arising from collider mono-X searches, the relic abundance, indirect and direct detection experiments. The "model-independent" approach allows to apply the results to different UV-complete models such as 2HDM+a, extended fermion sectors, the NMSSM and composite mediators.

Presenter: TENORTH, Valentin (Max-Planck-Institut für Kernphysik)

Session Classification: Parallel Session 1