

## Searches for ‘Relativistic’ Inelastic Dark Matter

*martedì 28 novembre 2017 14:30 (1 ora)*

I will propose a new dark matter direct detection strategy under non-minimal dark sector models. The main idea is to look for relativistic and inelastic scattering signatures of dark matter. An incoming boosted dark matter particle scatters off to a heavier unstable (dark-sector) state (if kinematically allowed) which subsequently decays back into dark matter along with lighter states including visible Standard Model particles. The expected signature is an energetic recoil of the target particle associated with the secondary decay product(s) from the heavier unstable state, which is quite unique and distinguishable from potential backgrounds. I will discuss some interesting phenomenology at several benchmark detectors/experiments.

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