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Affine gravitational scenario for dark-matter decays

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I discuss in this talk a new formulation of dark-matter (DM) coupling to gravity. Unlike the Standard Model (SM) sector which couples to the metric, DM couples to the spacetime affine connection through a Z_2-symmetry breaking term. I will show that such a structure allows DM to be only scalar particles (unlike the other alternative gravities). I discuss the different decay modes of DM in this framework, and comment on bounds from observational data. Furthermore, I will discuss the possible signatures at present and future colliders with an emphasis on light DM masses, *i.e.* $m_\phi \simeq \mathcal{O}(10)$ GeV.

Author: Dr JUEID, Adil (Konkuk University)

Co-authors: Dr AZRI, Hemza (United Emirates University); Dr KARAHAN, Canan (Istanbul Technical University); Prof. NASRI, Salah (United Emirates University)

Presenter: Dr JUEID, Adil (Konkuk University)

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