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Dark Matter Direct Detection with Spin-2 Mediators

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We consider models where a massive spin-two resonance acts as the mediator between Dark Matter (DM) and the SM particles through the energy-momentum tensor. We examine the effective theory for fermion, vector and scalar DM generated in these models and find novel types of DM-SM interaction never considered before. We identify the effective interactions between DM and the SM quarks when the mediator is integrated out, and match them to the gravitational form factors relevant for spin-independent DM-nucleon scattering. We also discuss the interplay between DM relic density conditions, direct detection bounds and collider searches for the spin-two mediator.

Authors: Ms CARRILLO-MONTEVERDE, Alba (University of Sussex); Prof. LEE, Hyun Min (CAU - Chung-Ang University (KR)); Prof. PARK, Myeonghun (Seoul National University of Science and Technology); Prof. SANZ, Veronica (University of Sussex); KANG, Yoo-Jin (Chung-Ang University)

Presenter: KANG, Yoo-Jin (Chung-Ang University)

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