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# Dark matter pair-production in the MSSM and simplified dark matter models at the LHC

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Dark matter (DM) makes up around 25% of the matter-energy content of our universe today. However, no evidence for a DM particle has been found so far. Supersymmetry adds an ideal candidate, a Weakly Interacting Massive Particle. To avoid its large parameter space with many parameters being unrelated to DM, such as in the Minimal Supersymmetric Standard Model (MSSM), simplified DM models (SDMMs) offer a way to describe only the DM phenomenology while other effects from new particles are neglected. If the DM particle is light enough, it can be produced at particle colliders to study its properties in a controlled way. Thus, for experimental searches to be as efficient as possible, a proper description of these models is required.

In my talk, I will present a comparison of DM pair-production at the LHC in the MSSM and SDMMs with s- and t-channel mediators. The comparison involves a scan over the MSSM parameter space, where the differences of the total cross sections and typical kinematical distributions between the different models are studied. All calculations are done at NLO QCD accuracy and the results for the distributions include parton showering in the POWHEG formalism.

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