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Patrick Stengel (Stockholm): Dark Matter and QCD-Charged Mediators in the Quasi-Degenerate Regim

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We study a scenario in which the only light new particles are a Majorana fermion dark matter candidate and one or more QCD-charged scalars, which couple to light quarks. This scenario has several interesting phenomenological features if the new particles are nearly degenerate in mass. In particular, LHC searches for the light scalars have reduced sensitivity, since the visible and invisible products tend to be softer. Moreover, dark matter-scalar co-annihilation can allow even relatively heavy dark matter candidates to be consistent thermal relics. Finally, the dark matter nucleon scattering cross section is enhanced in the quasi-degenerate limit, allowing direct detection experiments to use both spin-independent and spin-dependent scattering to probe regions of parameter space beyond those probed by the LHC. Although this scenario has broad application, we phrase this study in terms of the MSSM, in the limit where the only light sparticles are a bino-like dark matter candidate and light-flavored squarks.

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