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Sommerfeld enhancements and relic abundance of neutralino dark matter in the general MSSM

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We discuss the calculation of Sommerfeld enhancements on the neutralino LSP relic abundance calculation for heavy neutralino dark matter including co-annihilations of nearly mass-degenerate neutralino and chargino states. A newly developed EFT framework enables us to consider for the first time all (off)-diagonal potential and annihilation matrices including P- and next-to-next-to-leading order S-wave effects for a generic MSSM parameter space point, and to treat effects from heavy states perturbatively. To investigate the impact of the enhanced cross sections on the predicted neutralino relic abundance we identify interesting regions of parameter space. We discuss the different features of these regions, focusing in particular on heavy wino- and higgsino-like dark matter and models interpolating between the two scenarios.

Summary

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