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Importance of Non-Perturbative Effects for the Exclusion or Discovery of Dark Matter Models

Thursday, 7 July 2022 11:50 (15 minutes)

Based on the example of the currently widely studied t-channel simplified model with a colored mediator, I will demonstrate the importance of considering non-perturbative effects such as the Sommerfeld effect and bound state formation for accurately predicting the relic abundance and hence correctly inferring the viable model parameters. For instance, I will highlight that the parameter space thought to be excluded by direct detection experiments and LHC searches remains still viable and illustrate that long-lived particle searches and bound-state searches at the LHC can play a crucial role in probing such a model. Finally, I will demonstrate how future direct detection experiments will be able to close almost all of the remaining windows for freeze-out production, making it a highly testable scenario.

In-person participation

Yes

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