

Whispers from the Dark Universe - Particles & Fields in the Gravitational Wave Era

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WHISPERS FROM THE DARK UNIVERSE – PARTICLES & FIELDS IN THE GRAVITATIONAL WAVE ERA

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Sommerfeld effect and bound state formation for Dark Matter with colored mediators: a computational framework

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In the universal framework of simplified t-channel dark matter models, the relic abundance is dominated by mediator annihilation in most of parameter space, which gets considerably enhanced by the Sommerfeld effect and bound state formation. We provide an intuitive and easy to use add-on package to micrOMEGAs, allowing for an automated inclusion of these effects for a generic t-channel dark matter model. Albeit their effect is subdominant in the coannihilation regime, excited bound state levels are included as well. We analyze representative models with scalar and fermionic mediators and highlight the differences and common features between the two.

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