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Sommerfeld effect and unitarity

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The annihilation cross section of dark matter has an important role in dark matter phenomenology. If dark matter couples to a light force mediator, the exchange of the mediator non-perturbatively distorts the wave function of the dark matter from the plane wave. This effect significantly modifies the annihilation cross section .This effect is called as the Sommerfeld effect. In this talk, I will talk about how the annihilation cross section with Sommerfeld effect is calculated from Schroedinger equation. Our method is consistent with the partial wave unitarity bound and it can be applied to s-wave and higher-ell waves.

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