Phenomenology 2025 Symposium



Contribution ID: 153

Type: not specified

Sommerfeld Enhancement from Quantum Forces for Dark Matter

Tuesday 20 May 2025 15:15 (15 minutes)

I will discuss the Sommerfeld enhancement of scattering cross sections due to quantum forces. Quantum forces are forces which arise only at loop level. Since they are subject to corrections from a background with finite temperature or number density, there will also be an important contribution to the Sommerfeld enhancement in the presence of a background. In particular this can be applied to any dark matter (DM) model with quadratically coupled mediators. For certain models we find phenomena not previously observed in the literature on Sommerfeld enhancement, such as having both enhancement and suppression effects in the same model with different masses, and resonance peaks for massless mediators. I then point out and discuss some direct applications to DM phenomenology, including its effects on DM freeze-out and CMB distortions.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

Authors: YU, Bingrong (Cornell University); Prof. PERELSTEIN, Maxim (Cornell University); FERRANTE, Steven (Cornell University)

Presenter: FERRANTE, Steven (Cornell University)

Session Classification: Dark Matter

Track Classification: Dark Matter Theory and Detection