Contribution ID: **45** Type: **not specified**

Dark Light Boson Emission from Supernovae

Thursday 13 October 2022 11:00 (1h 30m)

Supernovae are good laboratories to investigate new physics beyond the Standard Model which contains light dark particles. This is because the additional energy leakage sources by the dark particle emission can change the star evolution significantly. We re-examined the dark light boson (axion, dark gauge boson) emission from supernovae especially focusing on the effects of local contact interactions, pion-mediated Thomson-like process, decay of dark particle outside/inside the star, and medium effects on the effective charge of the nucleon. We obtained new constraints. In this talk, I will explain the physics behind the constraints.

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