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Stellar limits on a light scalar

Abstract: A light CP-even scalar S with mass below GeV-scale exists in many beyond standard model (SM) scenarios. Such a light particle can be produced abundantly in the stars, such as the Sun, red giants, white dwarfs, horizontal-branch stars, neutron star mergers, and supernovae. In this talk I will show the state-of-art stellar limits on S . Assuming the couplings of S to the SM particles are from mixing with the SM Higgs, the production of S will be dominated by nucleon bremsstrahlung process in all the stars. With the decay and reabsorption of S taken into consideration, the stellar luminosities exclude a broad range of the mixing angle, from 7.0×10^{-18} to 3.4×10^{-3} , with the scalar mass up to roughly order of 100 MeV. These stellar limits are largely complementary to other laboratory, astrophysical and cosmological limits on S .

Scheduling Preferences

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