Phenomenology 2023 Symposium



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Search for sub-MeV axion-like particles from horizontal branch stars

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Axion-like particles (ALPs) coupled to photons are produced inside stars via the Primakoff process and photon coalescence. They spontaneously decay into two gamma-ray photons that escape from the stellar interior only if decays occur outside the photosphere. Owing to their hot and dense plasma and small radius of the photosphere, horizontal branch stars are promising astrophysical objects to detect the gamma-ray flux from ALP decays. We estimate the detectability of the ALP-induced gamma-ray flux at future MeV gamma-ray telescopes such as AMEGO-X and APT.

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