Contribution ID: **244** Type: **talk**

Axion-like Particle Searches at Rare Nuclear Isotope Accelerator Facilities

Wednesday, 14 July 2021 16:45 (15 minutes)

Rare nuclear isotope accelerator facilities provide high-flux proton beams to produce a large number of rare nuclear isotopes. The high-intensity nature of their beams enables investigating dark-sector particles including axion-like particles (ALPs). In this talk, we will discuss detection prospects of ALP, using its coupling to Standard Model photons, in DAMSA (Dump-produced Aboriginal Matter Searches at Accelerator), a proposed experiment at RAON (Rare isotope Accelerator complex for ONline experiment) constructed in Korea. DAMSA features the close proximity of its detector to the target (i.e., ALP production dump) and a high-intensity proton beam, and as a result, DAMSA is capable of probing a high-mass region of ALP parameter space, which has never been explored by the existing experiments, and the region below the so-called "cosmological triangle". While the neutrino-induced backgrounds produced in the target and subsequently entering the detector are greatly suppressed thanks to the low 600-MeV proton beam energy, the mitigation of huge beam-related neutron backgrounds is rather challenging. We argue that they can be significantly suppressed with a high-capability detector system and hence the proposed ALP searches are feasible, inspiring other nuclear isotope accelerator facilities to pursue similar physics opportunities.

Are you are a member of the APS Division of Particles and Fields?

Yes

Primary authors: KIM, Doojin (Texas A & M University (US)); YU, Jae (University of Texas at Arlington (US)); KONG, K.C. (University of Kansas); JANG, Wooyoung (Kyungpook National University (KR))

Presenter: KIM, Doojin (Texas A & M University (US))

Session Classification: Beyond Standard Model

Track Classification: Beyond Standard Model Physics