Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Study of Neutron Induced Backgrounds to the Axion-like Particle Search at RAON Facility in Korea MINSANG RYU, Univ of Seoul, WOOYOUNG JANG, University of Texas, DOOJIN KIM, Texas AM University, KYOUNGCHUL KONG, University of Kansas, YOUNGJOON KWON, Yeonsei University, JONG-CHUL PARK, Chungnam National University, SEODONG SHIN, Jeonbuk National University, UN-KI YANG, Seoul National University, JAEHOON YU, University of Texas — Rare nuclear isotope accelerator facility, such as Rare isotope Accelerator complex for ON-line experiment (RAON) which is under construction in Korea provides an excellent opportunity for exploring beyond the standard model physics, thanks to the high intensity proton beams at 600MeV. A beam dump experiment at such facility provides opportunities to search dark sector particles such as axion-like particles (ALPs) and dark photons. To take advantage of the new facility to be in operation shortly in Korea, we have proposed the Dark Matter Searches at Accelerators (DMSA) experiment whose primary goals are to search for ALP and other dark sector particles using a 1m thick iron beam dump and a 610-ton liquid argon time projection chamber (LAr TPC) detector in close proximity to the dump. The most concerned primary background to ALP searches at DMSA, given the proximity to the source of the beam, namely the dump is the secondary electromagnetic particles produced in the interactions of neutrons resulting from the high intensity 600MeV proton beams impinging on the iron dump. In this talk, we will present a detailed GEANT4 based study on the neutron induced backgrounds to the ALP search at DMSA beam dump experiment, including potential background mitigation strategy.

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Date submitted: 08 Jan 2021 Electronic form version 1.4