

Abstract Submitted  
for the APR21 Meeting of  
The American Physical Society

**Prospect of undoped inorganic crystals at 77 Kelvin for low-mass dark matter search and neutrino detection at Spallation Neutron Source<sup>1</sup>**  
KEYU DING, JING LIU, University of South Dakota, COHERENT COLLABORATION — For low-mass dark matter search, an experiment with a cylindrical 1kg undoped CsI crystal coupled directly to two photomultiplier tubes at about 77K was conducted and a light yield of 26.00.4 photoelectrons per keV electron-equivalent was achieved. The presumed prototype consisted of 10kg undoped CsI or NaI scintillation crystals directly coupled with SiPM arrays operated at 77K was assumed to have a much higher light yield compared to the COHERENT CsI(Na) detector. This eliminated the concern of self light absorption in large crystals raised in some of the early studies. For neutrino detection, the light yield of an undoped CsI crystal at about 77 Kelvin was measured to be 33.50.7 PE per keVee in the energy range of [13, 60] keVee using X and  $\gamma$ -rays from an <sup>241</sup>Am radioactive source. Based on this experimental result, the performance of 10kg cryogenic inorganic scintillating crystals coupled to SiPM arrays to probe non-standard neutrino interactions (NSIs) through the detection of coherent elastic neutrino-nucleus scatterings (CEvNS) at the Spallation Neutron Source (SNS), Oak Ridge National Laboratory (ORNL), was examined in detail.

<sup>1</sup>This work is supported by the NSF award PHY-1506036, and the Grant-in-Aid for Encouragement of Young Scientists (B), No. 26800122, MEXT, Japan. The Office of Research at the University of South Dakota. Computations supporting this project were performed on High Performance Computing systems at the University of South Dakota, funded by NSF award OAC-1626516.

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Date submitted: 06 Jan 2021

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