

Passive Crystal Neutrino Detectors for CEvNS Science and Security Applications

Wednesday 6 October 2021 13:05 (10 minutes)

Experimental efforts in CEvNS have gained significant momentum over the last few years, since the first observation of the CEvNS reaction at the SNS. Observing reactor CEvNS remains a milestone of interest with implications for basic science and nonproliferation reactor monitoring regimes. In this talk, we discuss a concept for an entirely passive, small, solid CEvNS detector that uses color center defects induced by CEvNS reactions in a crystal and light-sheet microscopy to obtain a signal. This concept, inspired by so-called “paleo-detectors” for astrophysical neutrinos and dark matter candidates, presents intriguing possibilities for a simpler low-threshold CEvNS detector. We will also review how this might be used for doing basic science physics with CEvNS at reactors and how it might be used to monitor nuclear reactors as part of international and multi-lateral security agreements.

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Session Classification: CEvNS Experiments