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Next-generation CEvNS experiments at the ESS and beyond

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The recent detection of coherent elastic neutrino-nucleus scattering (CEvNS) creates the possibility of using neutrinos to explore physics beyond the Standard Model with small-size detectors. However, the CEvNS process generates signals at the few-keV level, requiring sensitive detector technologies. High-yield neutrino sources, including the European Spallation Source (ESS) and nearby power reactors, have been identified to provide a unique opportunity for a definitive exploration of all phenomenological applications of CEvNS.
A number of different detector approaches are currently under development for deployment at these facilities. These next-generation technologies will be able to observe the process with a lower energy threshold and better energy resolution than current detectors. Combining their observations will allow for a complete phenomenological exploitation of the CEvNS signal. In particular, these measurements will not be statistically limited due to the synergy between larger neutrino fluxes and these improved detectors.
In this talk, I will present the main projects currently being developed to detect CEvNS with precision, focusing on two main spheres: efforts at the ESS like the CoSI project, which employs cryogenic undoped CsI crystals, and its sister GanESS, a high-pressure gas TPC; and efforts at the Ringhals nuclear plant utilizing the largest, lowest-threshold, Ge diodes in the world.

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