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Gaseous detectors for neutrino Physics at the ESS, the GanESS project, Francesc Monrabal

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The recent detection of the coherent elastic neutrino-nucleus scattering (CEvNS) opens the possibility to use neutrinos to explore physics beyond standard model with small size detectors. However, the CEvNS process generates signals at the few keV level, requiring of very sensitive detecting technologies for its detection. The European Spallation Source (ESS) has been identified as an optimal source of low energy neutrinos offering an opportunity for a definitive exploration of all phenomenological applications of CEvNS. In this project I propose to apply the high pressure gas TPC technology to the detection of the CEvNS process at the ESS. This will require the development of very low-energy detectors and to improve the current knowledge of the quenching factor for nuclear recoils in gas at keV energies. The major goal of this project is to build a 20 kg xenon gaseous detector and operate it at the ESS, such detector will provide more than 7,000 CEvNS events per year, overtaking the sensitivities of much larger detectors in current spallations sources.

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