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Nuclear ionization yield measurements in Neon gas using spherical proportional counter for the NEWS-G experiments

Monday 8 June 2020 16:00 (15 minutes)

NEWS-G (New Experiments With Spheres-Gas) is a rare event search experiment using Spherical Proportional Counters (SPCs). Primarily designed for the direct detection of dark matter, this technology also has appealing features for Coherent Neutrino-Nucleus Scattering ($\text{CE}\nu\text{NS}$) studies using nuclear power plants as a neutrino source.

For both applications, an important property of the gas to characterize is the ionization yield, or quenching factor, defined as the ratio of the measured energy induced by a nuclear recoil and an electronic recoil of the same energy. Quenching factor measurements in Neon based gas mixtures are being performed at TUNL (Triangle Universities Nuclear Laboratory) using a neutron beam and an array of backing detectors. We will present the set-up and techniques for quenching factor measurements and the most recent results obtained.

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