

Neutrons for Characterizing Dark Matter Detectors

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At the Queen's University Reactor Materials Testing Laboratory (RMTL) we are developing a quasi-monoenergetic beam of intermediate-energy neutrons. These neutrons will be used to do scattering experiments on the nuclei of gas atoms in the NEWS-G dark matter detector to measure the so-called quenching factor. The quenching factor relates the energy measured from nuclear recoils (such as from a neutron or dark matter detector) to electronic recoils (from normal calibration sources). The quenching factor depends on the nuclear recoil energy, so a specific and tunable neutron energy is important to get the best possible calibration for NEWS-G. I will describe progress made in 2020, with a new detector, shielding, nuclear targets, and improved positioning and alignment in the experimental room.

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Please select: Experiment or Theory

Instrumentation

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