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SBC-CE ν NS

The SBC collaboration is developing liquid argon filled scintillating bubble chambers with projected sensitivity to coherent elastic neutrino nucleus scattering (CE ν NS) from reactor neutrinos. Nuclear recoil induced bubbles are detected by cameras and piezoelectric acoustic sensors; scintillation photons from recoil events and backgrounds, shifted to 175 nm by xenon doping, are detected by an array of silicon photomultipliers. An initial 10-kg device is under construction at Fermilab to demonstrate effectively complete insensitivity to electron recoil backgrounds with nuclear recoil thresholds down to 100 eV. Follow-on devices will search for GeV-scale WIMPs down to the solar neutrino limit (SBC-SNOLAB), and attempt a first observation of CE ν NS for reactor neutrinos (SBC-CE ν NS). SBC-CE ν NS may be able to constrain non-standard interactions, the weak mixing angle at low energies, sterile neutrino oscillations, and neutrino magnetic moments.

Mini-abstract

SBC is developing LAr scintillating bubble chambers sensitive to CE ν NS from reactor neutrinos.

Experiment/Collaboration

SBC

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