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Boron-8 solar neutrinos search with the LUX-ZEPLIN (LZ) experiment

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The detection of solar neutrinos via coherent elastic neutrino-nucleus scattering (CEvNS) in liquid xenon time projection chambers (TPCs) represents a major milestone in neutrino physics, offering a new lens into the cosmos. Over the past two decades, liquid xenon TPCs have driven dramatic progress in rare-event detection. In particular, the LUX-ZEPLIN (LZ) experiment, operating a two-phase xenon TPC with a 7-tonne liquid xenon target, currently leads the search for Weakly Interacting Massive Particles (WIMPs). In addition to its dark matter mission, LZ provides a powerful platform to probe beyond-WIMP signals, including those from neutrinos. In this talk, I will present the current status of LZ's search for Boron-8 solar neutrinos via CEvNS—a signal expected just above the threshold of detectability in current-generation detectors—and discuss novel analysis techniques developed to mitigate a key background: accidental coincidences between uncorrelated charge and light signals.

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