

A crystalline xenon TPC to reach the neutrino detection limit

Friday 31 March 2023 18:15 (15 minutes)

We are developing a dual-phase crystalline/vapor xenon time projection chamber (TPC) as a potential upgrade path for the LZ or XENON dark matter search experiments, after they finish their current experimental operations. We expect it to enable full exclusion or tagging of the dominant radon-chain backgrounds in these instruments, while maintaining all of the known instrumental benefits and performance of a liquid xenon TPC. In this way, it could enable the current O(10) tonne experiments to reach the neutrino detection limit in <20 years. This talk will present recent results of the instrumental performance as well as a first demonstration of the radon exclusion power of crystalline xenon with respect to liquid xenon.

Primary authors: CHEN, Hao; GIBBONS, Ryan (Lawrence Berkeley National Laboratory); HASELSCHWARDT, Scott (Lawrence Berkeley National Laboratory); KRAVITZ, Scott (The University of Texas at Austin); XIA, Shilo Qing (Lawrence Berkeley National Laboratory); SORENSEN, Peter (Lawrence Berkeley National Laboratory)

Presenter: CHEN, Hao

Session Classification: SESSION 14: Direct detection: Technical Development-2 (CHAIR: Rafael Lang - Purdue University)

Track Classification: Non-directional direct dark matter detection