

# CrystaLiZe: A Solid Future for LZ

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Radon and its daughter decays continue to limit the sensitivity of WIMP direct dark matter searches, despite extensive screening programs, careful material selection and specialized Rn-reduction systems. This problem is only expected to worsen as experiments grow in size. For liquid xenon TPCs, we propose to address this through crystallizing the xenon. Once solid, the xenon will no longer admit external Rn into the bulk, allowing existing Rn to decay away. These decays can also be efficiently vetoed using the time structure of the decay sequence and the fixed position of daughter isotopes. In this case, the limiting background for WIMP searches would be neutrinos from the sun and from cosmic ray muons. In this talk, I will argue that an instrumental radon tag in a crystalline xenon TPC, perhaps as an upgrade to LZ, may be the quickest path to reaching the neutrino floor and present preliminary results from a solid xenon test stand which indicate its viability as a detector medium.

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