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Progress Toward a Superfluid 4He Detector for Light Dark Matter (HeRALD)

Thursday, 31 August 2023 16:30 (15 minutes)

We report recent progress toward using superfluid 4He for nuclear recoil direct detection, as part of the overall TESSERACT pre-Project R&D effort. in the US. The 4He “quantum evaporation” signal pathway allows both a low threshold and the possibility of rejecting the primary background (heat-only events in the calorimetry itself) through multi-channel coincidence. We have recently demonstrated the key technology of heat-free superfluid film-stopping, newly allowing measurements of 4He scintillation and evaporation signal yields at sub-keV energies.

Submitted on behalf of a Collaboration?

Yes

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Session Classification: Dark matter and its detection

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