



Contribution ID: 100

Type: Poster

A novel approach to purification in small-scale noble liquid systems

Tuesday, November 7, 2023 6:20 PM (20 minutes)

The inert-behavior, high nuclear mass, and scintillating properties of liquid Argon and Xenon make them attractive for use in a variety of sensitive experiments. However, great care must be taken to remove electronegative impurities which reduce light yield from scintillation, and degrade the resolution of ionization-charge imaging. An external purification circuit is generally beyond the of smaller systems devoted to detector R&D, where instead various creative pumping approaches have been developed. We present progress towards the development of a novel, mechanically inactive, submerged pump and purification system for liquid Argon developed at Lawrence Berkeley National Laboratory. This system is low noise, low power, pressure safe, low cost, and achieves nearly continuous O(liters/min) flow rates using only a resistive heater as the primary energy input.

Early Career

Yes

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Session Classification: Poster Session

Track Classification: RDC Parallel Sessions: RDC1: Noble Element Detectors