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Detector R&D with Negative Ion Mixtures

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Negative ion (NI) gas mixtures offer many benefits for directional detection, including low (near-thermal) diffusion and the possibility of adding spin-dependent targets for dark matter (DM) searches. However, the unforeseen benefit of multiple NI species allowing for fiducialization of the drift coordinate in time projection chambers (TPCs) might allow for uses beyond directional detection. We will present some gaseous detector R&D results from an argon-SF₆ mixture, and discuss plans to identify NI species suitable for use in liquid-media TPCs.

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