

Particle tracking in the Negative Ion Gas SF₆ with a Micromegas

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Recent work demonstrated gas gain in the negative ion gas SF₆ using GEMs and Thick GEMs. SF₆ is a favorable gas for directional dark matter detection with a TPC because it provides low diffusion (at the thermal limit), strong sensitivity to spin-dependent WIMP dark matter (through the high fluorine content), and full-volume fiducialization (thanks to multiple negative ion species). In this work, we present results from a prototype detector showing successful operation of a Micromegas with strip readout in SF₆ gas, and discuss the prospects for directional dark matter detectors using this readout technology.

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