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Negative Ion Gridpix based High resolution TPC (NIGHT) detector

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Time projection chambers (TPC) operating with a negative ion gas have the potential to be used in directional dark matter searches. The proof of concept detector, NIGHT, is a TPC with a GridPix readout, which in turn consists of a Timepix ASIC with an integrated amplification stage called InGrid. It has an active area of 1.4cmx1.4cm and a drift length of 3cm.

The detector will be operated with a mixture of He and the negative ion gas SF6 at different ratios and pressures and the results will be compared with the electron drift gases. With this study, we aim to understand not only the properties of SF6 but also the benefits of the pixelated detector to be used in directional dark matter searches.

In this poster, the NIGHT detector will be presented regarding its principles, design and preliminary results.

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