

The NEWS-G light Dark Matter search experiment: Physics results from a 10 day exposure with pure methane gas

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The NEWS-G direct detection dark matter search experiment uses spherical proportional counters (SPCs) with light noble gasses to search for low mass WIMP-like dark matter. The current iteration of the experiment consists of a large 140 cm diameter SPC installed at SNOLAB benefiting from a new sensor design, and improvements in detector performance and data quality. Before its installation at SNOLAB, the detector was operated with 135 mbar of pure methane gas at the Laboratoire Souterrain de Modane inside a temporary water shield, offering a hydrogen-rich target and reduced backgrounds. We present results from a 10-day physics campaign in these conditions, including calibrations of the detector response down to the single ionization regime. The installation of the experiment at SNOLAB and other future works are also presented.

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