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Final results on the search for low-mass WIMPs with the NEWS-G experiment

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NEWS-G is a dark matter direct-detection experiment using spherical proportional counters with light noble gases in the search for low-mass WIMPs. We report on the final results of the analysis of 42 days of WIMP-search data taken at the Laboratoire Souterrain de Modane using a 60 cm diameter sphere filled with a mixture of Ne + CH4 (0.7%) at 3.1 bars. Competitive constraints are set on the spin-independent WIMP-nucleon scattering cross-section for WIMP masses in the 1 GeV region. The next phase of the NEWS-G experiment is also presented : a 140 cm diameter sphere capable of handling 10 bars to be operated at SNOLAB. The use of lighter nuclei such as H and He will improve the sensitivity to sub-GeV WIMP masses.

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