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Search for Dark Matter with NEWS-G experiment

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The NEWS-G direct dark matter search experiment is using spherical proportional counters (SPCs) with light noble gases as Ne, He, H to explore very low mass WIMPs parameter space. First results obtained with a SPC prototype operated with Ne gas at the Laboratoire Souterrain de Modane (LSM) have already placed NEWS-G as a leader in the search for low-mass WIMPs. Recent and planned improvements for the next phase of the experiment will be presented including the reduction of the background levels, detector performances and stability, and detector characterization. The next generation detector will consist of a larger volume 140 cm diameter SPC to be operated at SNOLAB with H and He gas. The use of lighter targets, improved thresholds and detector performance and with a significant reduction of the background levels will allow for unprecedented sensitivity to sub-GeV WIMPs down to 0.1 GeV. The current and future stages of the NEWS-G experiment in the context of the global dark matter search will also be discussed.

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