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NEWS-G: Search for Light Dark Matter with a Spherical Proportional Counter

The NEWS-G collaboration is searching for light dark matter candidates using a spherical proportional counter. Access to the mass range from 0.1 to 10 GeV is enabled by the combination of low energy threshold, light gaseous targets (H, Ne), and highly radio-pure construction. The current status of the experiment will be presented, along with the first NEWS-G results obtained with SEDINE, a 60 cm in diameter spherical proportional counter operating at LSM (France), excluding cross-sections above $4.4 \times 10^{-37} \text{ cm}^2$ for 0.5 GeV WIMP using a neon-based gas mixture. The construction of the next generation, 140 cm in diameter, spherical proportional counter using 4N copper at LSM will be discussed, along with the latest advances in SPC instrumentation. The detector, following initial commissioning at LSM is currently being installed at SNOLAB (Canada), with the first physics run scheduled for later this year. Finally, future prospects and applications of spherical proportional counters will be summarised.

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