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

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The NEWS-G collaboration is searching for light dark matter candidates using a novel detector concept, the spherical proportional counter.
Access to the mass range from 0.05 to 10 GeV is enabled by the combination of low energy threshold, light gaseous targets (H, He, Ne),
and highly radio-pure detector construction. Initial NEWS-G results obtained with SEDINE, a 60 cm in diameter spherical proportional counter operating at LSM (France), excluded for the first time WIMP-like dark matter candidates down to masses of 0.5 GeV. The construction and on-going commissioning of a new, 140 cm in diameter, spherical proportional counter constructed at LSM using 4N copper with 500 um electroplated inner layer will be presented. The detector is scheduled to collect data in SNOLAB (Canada) later this year. The design and construction of ECUME, a 140 cm in diameter spherical proportional counter fully electroformed underground will be discussed. The potential to achieve sensitivity reaching the neutrino floor in light Dark Matter searches, with a next generation detector are also summarised.

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