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NEWS-G, Light dark matter search with a Spherical Proportional Counter, First results and Future prospects

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NEWS-G (New Experiments With Spheres-Gas) is an innovative experiment aiming to shine a light on the dark matter conundrum using a novel gaseous detector, the Spherical Proportional Counter. It uses light noble gases, such as Hydrogen, Helium, and Neon, as targets, to search for Weakly Interacting Massive Particles (WIMPs) down to the sub-GeV/c^2 mass region. The first detector of NEWS-G (SEDINE), is a 60 cm diameter sphere already operated in the Underground Laboratory of Modane (France), while the full-scale detector, with 140 cm diameter, will be installed in SNOLab (Canada) at the end of this year. In this talk, I will present the first NEWS-G results with Neon as target nuclei, which exclude at 90% confidence level (C.L.) cross-sections above $4.4 \cdot 10^{37}$ cm^2 for a 0.5 GeV/c^2 WIMP based on 9.7 kg·days of exposure, and I will discuss the status of the project and prospects for the future.

Summary

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