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## **NEWSdm : directional dark matter searches with nuclear emulsion**

*Thursday 31 August 2023 14:00 (15 minutes)*

The presence of dark matter can explain several observations in the universe. However, its nature is still unknown. Therefore, the study of dark matter is a rapidly evolving field. New techniques and methods are being applied all the time. The measurement of the direction of WIMP-induced nuclear recoils is a challenging strategy to extend dark matter searches beyond the neutrino floor and provide an unambiguous signature of the detection of Galactic dark matter. The sensitivity of gas detectors are limited by the small achievable detector mass to reach the neutrino floor. NEWSdm is an innovative directional experiment proposal based on the use of a solid target which is made by newly developed nuclear emulsion and read-out systems achieving a position accuracy of 60 nm. The nuclear emulsion technology is the most promising technique with nanometric resolution to disentangle the dark matter signal from the neutrino background. In this talk, we discuss the experiment design, its physics potential, the near-future plans. After the submission of a Letter of Intent, a new facility for emulsion handling was constructed in the Gran Sasso underground laboratory and different measurements have been carried out, including the first directional measurement of sub-MeV neutrons. A Conceptual Design Report is in preparation and will be submitted in 2023.

### **Submitted on behalf of a Collaboration?**

Yes

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