

Direct Dark Matter search with nuclear emulsion based detector

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Direct dark matter searches are promising techniques to identify the nature of dark matter particles. A variety of experiments have been developed over the past decades, aiming to detect Weakly Interactive Massive Particles (WIMPs) via their scattering in a detector medium. Exploiting directionality would also give a proof of the galactic origin of dark matter making it possible to have a clear and unambiguous signal to background separation. The directional detection of Dark Matter requires very sensitive experiment combined with highly performant technology. The NEWSdm experiment, based on nuclear emulsions, is proposed to measure the direction of WIMP-induced nuclear recoils. We discuss the potentiality, both in terms of exclusion limits and potential discovery, of a directional experiment based on the use of a solid target made by newly developed nuclear emulsions and read-out systems reaching sub-micrometric resolution.

Summary

NEWSdm collaboration submitted Letter of Intent to the Gran Sasso Scientific Committee. Since a few years a lot of R&D is undertaken in emulsion and scanning technologies in the collaboration. We would like to report ongoing activities; reporting the update on our sensitivity including the direction information. Please consider enclosed abstract for an oral presentation.

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