

Contribution ID: 19

Type: Presentation

Recent results from DEAP-3600

Wednesday, 21 September 2022 12:05 (15 minutes)

DEAP-3600 is the largest running dark matter detector filled with liquid argon, set at SNOLAB, in Sudbury, Canada, 2 km underground. The experiment holds the most stringent exclusion limit in argon for WIMPs above 10 GeV/c^2. In the published analysis the background events due to alpha-inducing scintillation in the neck of the detector limited the sensitivity. Both the hardware upgrades and the multivariate analysis are going to decrease this background and eventually improve the the detector sensitivity in the next upcoming WIMP search.

Moreover, the WIMP analysis has been revisited in terms of a non-relativistic effective field theory framework and explored the impact of possible substructures in the galactic dark matter halo, motivated by the latest results from Gaia and the Sloan Sky Digital Survey, setting the world best exclusion limit for xenon-phobic dark matter scenarios. Finally, a custom-developed analysis has recently pointed out the extraordinary sensitivity also to ultra-heavy, multi-scattering dark matter candidates, that has resulted in world leading exclusion limits on two composite dark matter candidates with masses up to the Planck-scale.

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Session Classification: Applications

Track Classification: Applications (dark matter, neutrino, medical physics etc.)