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Status and Upgrades of the DEAP-3600 Experiment

Thursday, 21 May 2026 08:30 (30 minutes)

The DEAP-3600 experiment at SNOLAB utilizes 3.3 tonnes of liquid argon to search for dark matter and rare nuclear processes. Benefiting from stable, low-background operation, the experiment is expanding its physics reach through advanced analysis and hardware improvements.

This talk presents the WIMP search status using the Profile Likelihood Ratio method. Leveraging 790.8 live-days of data, an updated background model, and increased fiducial volume, we aim to maximize sensitivity to the spin-independent WIMP-nucleon cross-section.

Simultaneously, DEAP-3600 searches for ^{8}B solar neutrino absorption on ^{40}Ar in the MeV scale. Identifying the resulting excited ^{40}K state would demonstrate liquid argon's suitability for solar neutrino spectroscopy. This requires precise understanding of high-energy backgrounds like radiogenic neutron capture and cosmogenic muons.

Finally, we will describe hardware upgrades for the upcoming campaign. Improvements like pyrene-doped polystyrene neck coating and enhanced filtration aim to mitigate alpha particle backgrounds, paving the way for improved future sensitivity.

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