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(Remote) Latest results and future prospects of DEAP-3600

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The DEAP-3600 experiment is a direct dark matter detection experiment located 2 km deep underground at SNOLAB, Canada. 3.3 tonnes of liquid argon contained in an acrylic vessel instrumented with 255 PMTs are used for this experiment. It aims to measure nuclear recoil of argon caused by weakly interacting massive particles (WIMPs), a potential dark matter candidate. Since 2019, DEAP-3600 has held the most stringent exclusion limit on WIMP-nucleon interaction cross-section in argon above 20 GeV mass scale.

New measurements of scintillation quenching of alpha particles and the half-life of ^{39}Ar using DEAP-3600 have been concluded. Improvements on position reconstruction of the detector have been made. A profile likelihood ratio analysis of data is underway to enhance constraints on WIMPs. A dedicated search for solar neutrino absorption in argon is also nearing completion. An upgrade of the experiment to mitigate backgrounds coming from a shadowed region of the detector and possibly from dust in the liquid argon is in its final phase. A new data-taking campaign is set to commence soon.

This contribution will provide a comprehensive overview of DEAP-3600, summarizing the current status, the latest results, and the future prospects of the experiment.

Collaboration(s)

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