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The Search for Dark Matter with Liquid Argon: DEAP-3600, DarkSIde-20k, and ARGO

Wednesday 29 May 2024 11:00 (30 minutes)

The Global Argon Dark Matter Collaboration is working on a series of direct searches for dark matter using liquid-argon targets. We are currently operating DEAP-3600 at SNOLAB and are upgrading it to reach design sensitivity and to prove a background model with a rate of ~1 event/tonne year. We are also building the DarkSide-20k detector, currently under construction at the LNGS laboratory in Italy. DarkSide-20k is a two-phase Time Projection Chamber with low-radioactivity acrylic walls and optical readout with Silicon PhotoMultipliers (SiPMs). Notably, DarkSide-20k will be filled with Underground Argon, low in the cosmogenically-produced background of Ar-39. We will discuss the sensitivity and status of DarkSide-20k. The collaboration is starting early design work on ARGO, a proposed multi-hundred-tonne detector for deployment at SNOLAB. We will discuss early planning and design concepts for ARGO. The Canadian efforts in these international projects will be emphasized.

Keyword-1

dark matter

Keyword-2

argon

Keyword-3

low background

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