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Searching for Dark Matter with Liquid Argon: DEAP-3600, DarkSide-20k, and ARGO

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Cosmological dark matter remains an important unsolved problem in physics. Direct detection using liquid argon offers exciting discovery potential to the “neutrino fog” with sensitivity to spin-independent WIMP-nucleon cross sections below 10^{-48} cm^2 . A program of phased deployment of ever more sensitive detectors will be described, including the upgraded DEAP-3600 experiment at SNOLAB, the DarkSide-20k experiment at Grans Sasso Laboratory, and ARGO, a multi-hundred tonne future detector at SNOLAB. We discuss control of important backgrounds throughout the program and highlight some of the technologies to reduce those backgrounds including surface coatings, low-radon assembly, and readout and electronics.

Keyword-1

dark matter

Keyword-2

argon

Keyword-3

low-background

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