



Contribution ID: 9

Type: **Poster**

# The Hardware Upgrades and Third Fill of DEAP-3600 at SNOLAB

*Wednesday, 2 October 2024 19:40 (20 minutes)*

The hardware upgrades and third fill of DEAP-3600 are designed to produce a zero-background dark-matter measurement. DEAP-3600 is a single-phase liquid-argon detector containing 3300kg of liquid argon in a ultra-pure transparent acrylic sphere. TPB, on the inner surface of the acrylic, is used to wavelength shift argon scintillation light into the visible, this allowing its detection by an array of 255 Hamamatsu high quantum efficiency PMTs. Using the background model derived from the analysis of the second fill, we developed redundant techniques to remove the two leading alpha-particle backgrounds in the DEAP-3600 second-fill data set. The first class of events is degraded alphas from particulates in the bulk liquid argon and the second class is events in the neck of the detector, of which only a small fraction of light from argon scintillation enters the main volume of the detector. We have upgraded the argon process systems to allow for removal of bulk liquid from the detector, thus allowing particulate filtration. We have rebuilt the lower part of the neck in a low-radon cleanroom and have developed new techniques to paint the neck with pyrene-doped polystyrene to tag alpha neck events. This poster will present the work of the hardware upgrades and describe the run plan for the third fill.

**Primary authors:** JILLINGS, Christopher (SNOLAB / Laurentian University); DEAP-3600 COLLABORATION

**Presenter:** JILLINGS, Christopher (SNOLAB / Laurentian University)

**Session Classification:** Poster Session