

The optical simulation model of the DarkSide-20k Veto detector

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DarkSide-20k is a rare-event search experiment dedicated to finding signals of dark matter particles. The DarkSide-20k time projection chamber detector registers ionisation and scintillation signals originating from the particles interacting with the liquid argon detector medium. It is enclosed in a single-phase liquid argon neutron veto tank, equipped with Gd-loaded panels for capturing neutrons. Due to particle identification and vetoing carried out through the light signal, it is crucial to maximising the light yield. Light collection efficiency depends on various aspects of the detector, and particularly for the Veto detector, which has a photosensor coverage of the order of a per cent, the reflectivity of materials used has a big impact. To quantify the amount of collected light a comprehensive Geant4 simulation is done, which uses optical characterization data. The focus of the talk will be on a detailed description of the optics model for the Veto of the experiment.

Reference to paper (DOI or arXiv)

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