

Low radioactivity Argon for the DarkSide-20k experiment

Tuesday, May 25, 2021 6:06 AM (18 minutes)

A major worldwide effort is underway to procure the radiopure argon needed for DarkSide-20k (DS-20k), the first large scale detector of the new Global Argon Dark Matter Collaboration. The Urania project will extract and purify underground argon (UAr) from CO₂ wells in the USA at a production rate of ~300 kg/day. Additional chemical purification of the UAr will be required prior to its use in the DS-20k LAr-TPC. The Aria project will purify UAr using a cryogenic distillation column (Seruci-I), located in Sardinia (Italy). Assessing the UAr purity in terms of Ar-39 is crucial for the physics program of the DarkSide-20k experiment. DARt is a small (~1 litre) radiopure chamber that will measure the Ar-39 depletion factor in the UAr. The detector will be immersed in the active liquid Ar volume of ArDM (LSC, Spain), which will act as a veto for gammas from the detector materials and the surrounding rock. In this talk, I will review the status and prospects of the UAr projects for DarkSide-20k.

TIPP2020 abstract resubmission?

Funding information

Primary author: SANTORELLI, Roberto (Centro de Investigaciones Energéticas Medioambientales y Tecnol)

Presenter: SANTORELLI, Roberto (Centro de Investigaciones Energéticas Medioambientales y Tecnol)

Session Classification: Experiments: Dark Matter Detectors

Track Classification: Experiments: Experiments: Dark Matter Detectors