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Direct Dark Matter searches with the DarkSide-20k experiment

Thursday, 22 September 2022 10:30 (20 minutes)

DarkSide-20k is a next-generation direct dark matter search experiment under construction at the Gran Sasso National Laboratory (LNGS) in Italy. The core of the detector is a two-phase liquid argon time projection chamber designed to probe WIMP interactions down to the neutrino floor, with an exposure goal of ˜200 tonne-years in expectation of a WIMP-nucleon cross section of 10ˆ-47 cm2 for a WIMP mass of 1TeV/c2 during a 10-year run. In order to ensure zero instrumental backgrounds, low-radioactivity underground argon (depleted in 39Ar) is used as the detector medium. This reduces the internal background, while a 25 cm2 Silicon Photo Multiplier (SiPM) modules capable of resolving single photoelectrons are developed and will be installed in both the active detector volume and the veto system. An overview of the DarkSide experimental program and the DarkSide-20k detector will be presented with a focus on the SiPM construction and testing procedures.

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Session Classification: Session 1 (morning)