

DARKSIDE: RECENT RESULTS WITH UNDERGROUND ARGON AND OUTLOOK

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DarkSide-50 is a two-phase 50 kg liquid argon TPC, shielded by a liquid scintillator neutron veto and by a water Cherenkov muon veto, running at LNGS since October 2013. In the first run, DarkSide-50 operated with atmospheric argon (1,422 kg day exposure), collecting and completely rejecting about 16 millions of background events in the region of interest, mostly originating from ^{39}Ar . Operations with underground argon, started in March 2015, demonstrated an ^{39}Ar suppression factor larger than 1,000. The ^{39}Ar suppression factor in underground argon combined with the exceptional electron recoil rejection power are paving the way towards the next DarkSide phase, the 20-tonne fiducial DarkSide-20k detector.