

Darkside Status and Prospects

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DarkSide uses dual-phase Liquid Argon Time Projection Chambers to search for WIMP dark matter. The current experiment, DarkSide-50, has a 50-kg-active-mass TPC surrounded by a borated-liquid-scintillator neutron detector and a water Cherenkov detector. DarkSide-50 has been running continuously since 2013, initially with atmospheric argon and then, starting in mid-2015, with argon from underground. The underground argon (UAr) is measured to contain lower Ar-39, the largest source of background, than atmospheric argon by a factor of >1000 . After initial analyses of 50 live-days of atmospheric argon and 70 live-days of UAr, we have now collected 500 live-days of additional WIMP search data with UAr. This is being analyzed in a blind analysis. The proposed next stage of the DarkSide program is DarkSide-20k, a 20-tonne fiducial mass TPC designed to have background well below that from coherent scattering of solar and atmospheric neutrinos.

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