

Abstract Submitted
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Detecting Neutrinos with DarkSide-20k ZIPING YE, Univ of Houston, DARKSIDE COLLABORATION — The core detector of DarkSide-20k experiment is a two-phase liquid argon time projection chamber (LAr TPC) with 20 tons fiducial mass. It is designed to register possible nuclear recoil events due to rare scattering of dark matter particles off atomic nuclei, and is located deep underground at Gran Sasso National Lab (LNGS) in Italy. DarkSide-20k can achieve background free rare event searches thanks to the following features: a cosmic ray muon veto, a neutron veto, low-radioactivity argon in the TPC, pulse shape discrimination between nuclear recoil and electron recoil, and 3D coordinate reconstruction. It is thus ideal for weakly interacting massive particle (WIMP) searches. As a bonus, it is also very promising for studying neutrinos. Coherent neutrino-nucleus scattering (CNNS) would produce nuclear recoils with energies similar to collisions from dark matter particles. Our studies show that DarkSide-20k could uniquely contribute to the detection of supernova burst neutrinos, diffuse supernova and stellar neutrinos, and other sources of neutrinos. Detecting neutrinos in DarkSide-20k would also define the neutrino floor for WIMP searches.

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