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Direct Dark Matter Search with XENON100

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The XENON program aims at the direct detection of dark matter in the form of Weakly Interacting Massive Particles (WIMPs). A two-phase Time Projection Chamber (TPC) filled with ultra pure liquid xenon (LXe) is used for detecting nuclear recoils from WIMPs scattering off the Xe nuclei.

The XENON100 experiment is the second phase of the XENON program. It has a total mass of 161 kg of LXe, with a sensitive volume of 62 kg and 99 kg active veto. The results of the direct dark matter search with XENON100 will be presented. In particular, no evidence for dark matter is found in 224.6 live days of XENON100 data, excluding spin-independent WIMP-nucleon scattering cross sections above $2 \times 10^{-45} \text{ cm}^2$ for a 55 GeV/c² WIMP. The most stringent limit is established on the spin-dependent WIMP-neutron interaction for WIMP masses above 6 GeV, with a minimum cross section of $3.5 \times 10^{-40} \text{ cm}^2$ for a 45 GeV/c² WIMP.

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