

Lastest results from the XENON Dark Matter Project

Saturday 7 July 2018 11:20 (20 minutes)

The XENON1T experiment for the direct detection of dark matter is located at the Laboratori Nazionali del Gran Sasso in Italy. The detector uses 3.2 tons of liquid xenon with ~2 tons being inside the dual phase time projection chamber (TPC).

A first dark matter search conducted between November 2016 and January 2017 in a 5-40 keV_{nr} energy window did not yield evidence for dark matter interactions within the 35.6 (ton × day) exposure. This allowed to set the most stringent limits so far on the spin-independent scattering cross section of Weakly Interacting Massive Particles (WIMP) on nucleons for WIMP masses above 10 GeV/c². The limit features a minimum of $7.7 \times 10^{-47} \text{ cm}^2$ for 35 GeV/c² WIMPs at 90% confidence level. Since this science run 0 result a total exposure of 1 (ton×year) has been acquired allowing a significant step in sensitivity of direct dark matter search. Additionally to the large exposure, XENON1T's sensitivity relies on an electronic recoil background below 2×10^{-4} events/(kg × day × keV_{ee}) - the lowest ever achieved for a dark matter detector.

This talk will describe the XENON1T detector, the data analysis and the results of the new science run 1.

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Session Classification: Dark Matter Detection

Track Classification: Dark Matter Detection