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LUX results and LZ sensitivity to dark matter WIMPs

Friday, July 6, 2018 11:30 AM (30 minutes)

Weakly Interacting Massive Particles (WIMPs) remain one of the most promising dark matter candidates. Many experiments around the world are searching for WIMPs and currently the best sensitivity to WIMP-nucleon spin-independent cross-section is about 10^{-10} pb. LUX has been one of the world-leading detectors in a search for dark matter WIMPs. Results from the LUX experiment on WIMP searches for different WIMP masses, as well as the search for axions and axion-like particles will be presented. The LUX detector will soon be replaced by its successor, the LUX-ZEPLIN (LZ) detector. With 50 times bigger fiducial mass and an increased background rejection power due to the specially design veto systems, the LZ experiment, due to take first data in 2020, will achieve the sensitivity to WIMPs exceeding the current best limits by almost 2 orders of magnitude (for spin-independent interactions and for WIMP masses exceeding a few GeV). An overview of the LZ experiment will be presented and the LZ sensitivity will be discussed in connection to the accurately modelled background based on the high-sensitivity material screening campaign.

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