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【378】 XLZD: The Future of Direct Dark Matter Detection

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Dual-phase time projection chambers (TPCs) provide the strongest constraints on the spin-independent WIMP-nucleon cross-section and great sensitivity towards other dark matter candidates. With greater exposure, this technology is expected to be able to probe dark matter cross-sections down to the neutrino fog, where coherent elastic neutrino-nucleus scattering processes pose an irreducible background. This also opens the possibility to further explore astrophysical neutrino sources. To achieve this goal, the XENON, LUX-ZEPLIN, and DARWIN (XLZD) collaborations plan to build a next-generation detector: a TPC employing about 60 t of xenon. This talk will introduce the broad physics reach of the XLZD detector and focus on the ongoing R&D needed to achieve these ambitious goals.

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