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XLZD – the next generation of dark matter search

Liquid xenon based dark matter experiments have rapidly increased in size and sensitivity in recent years. They are at the forefront of the search for dark matter interactions with nuclei for dark matter masses above a few GeV/c^2 . Achieving this objective requires maintaining an ultra-low background level while scaling up the active target mass by about a factor of 10 compared to current-generation detectors. XLZD represents a unique collaboration that brings together the XENON, LUX-ZEPLIN, and DARWIN collaborations, joining their complementary expertise and technologies. This definitive experiment is designed to achieve unmatched sensitivity, probing the accessible WIMP parameter space above the neutrino fog. In addition, XLZD will perform a competitive search for neutrinoless double-beta decay and will be sensitive to a wide variety of other science targets. I will discuss the scientific goals of XLZD, as well as ongoing R&D efforts undertaken for the experiment design.

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