

CDEX 暗物质实验现状与展望

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CDEX 合作组自 2009 年以来在世界岩石覆盖最深的锦屏地下实验室使用点电极高纯锗探测器开展暗物质直接探测。最近, 基于 CDEX-1 和 CDEX-10 实验发表了多项国际先进水平的物理结果, 包括暗物质年度调制效应分析 [1]、基于 Migdal 效应的亚 GeV 轻暗物质搜索 [2]、暗光子探测 [3]、太阳轴子和类轴子探测 [4]、有效场论框架下的 WIMP 探测 [5] 等。目前正在开展 50 公斤级高纯锗阵列暗物质实验 (CDEX-50dm) 的准备和关键技术预研, 如锗晶体生长、高纯锗探测器自主研制、地下实验室低本底电解铜、低噪声低阈值前端电子学等。本报告将讨论 CDEX 暗物质实验的现状以及未来展望。

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4. Y. Wang et al. (CDEX Collaboration) “Improved limits on solar axions and bosonic dark matter from the CDEX-1B experiment using profile likelihood ratio method” Phys. Rev. D 101, 052003 (2020)
5. Y. Wang et al., (CDEX Collaboration), First experimental constraints on WIMP couplings in the effective field theory framework from CDEX, Sci. China-Phys. Mech. Astron. 64, 281011 (2021)

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