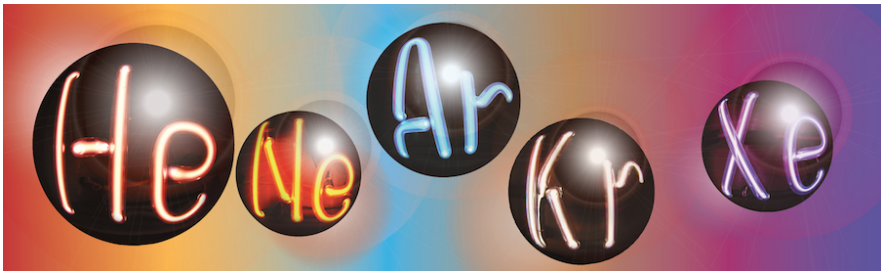

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Impact of extreme ultraviolet radiation on the scintillation of pure and xenon-doped liquid argon

Friday, 24 October 2025 11:00 (20 minutes)

The X-ArT (Xenon-Argon Technology) collaboration has studied the scintillation mechanisms in pure and Xe-doped liquid argon (LAr) using silicon photomultipliers sensitive to different wavelength ranges. Thanks to our measurements we identified a long-lived (>10μs) component attributed to extreme ultraviolet (EUV) photons emitted by the metastable levels of atomic argon. Based on this observation we developed a Xe-Ar scintillation model that includes both the EUV radiative contribution and the traditional collisional transfer process. Moreover we explored how the scintillation light yield and pulse shape discrimination vary as a function of the xenon concentration. Finally we proposed the EUV component as a possible source of the spurious electron emission in pure liquid argon, the main background in the search of light dark matter with noble liquid TPCs.

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