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Delayed backgrounds and charged liquid surface effects in dual-phase detectors.

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In advanced detectors, we observe events of stored energy releases, as well as energy accumulation and delayed release dynamics. Spontaneous burst emission of electrons, photons, phonons, and quasiparticles produces excess backgrounds in different dark matter detectors. Accumulation of unextracted charges on the liquid-gas interface in large dual-phase detectors can lead to surface instabilities and suppression of small electron signals extraction.
While we see evidence of surface instabilities, effects of small signal suppression were not checked out by low-energy calibration procedures, which can lead to significant systematic errors in recent papers claiming the detection of solar neutrinos in large dual-phase Xenon detectors.
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