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Stored energy releases: material problem in dark matter search and quantum computing

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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 phonons, photons, and quasiparticles produces excess backgrounds in dark matter detectors and correlated quantum errors and decoherence in quantum information devices- in the same way as external particles. These effects are now observed in all common materials used for detectors and qubits, presenting a fundamental condensed matter problem that has not been considered in research programs studying materials for quantum computers. Collaborative research program between HEP, material science, and QIS is required for these fundamental material effects affecting high-priority DOE projects in fundamental science and national security.
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