Abstract Submitted
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Auger recombination in sodium iodide[1] ANDREW MCALLISTER, EMMANOUIL KIOUPAKIS, Univ of Michigan - Ann Arbor, DANIEL ÅBERG, Lawrence Livermore National Laboratory, ANDRÉ SCHLEIFE, Univ of Illinois - Urbana-Champaign, LLNL — Scintillators are an important tool used to detect high energy radiation - both in the interest of national security and in medicine. However, scintillator detectors currently suffer from lower energy resolutions than expected from basic counting statistics. This has been attributed to non-proportional light yield compared to incoming radiation, but the specific mechanism for this non-proportionality has not been identified. Auger recombination is a non-radiative process that could be contributing to the non-proportionality of scintillating materials. Auger recombination comes in two types - direct and phonon-assisted. We have used first-principles calculations to study Auger recombination in sodium iodide, a well characterized scintillating material. Our findings indicate that phonon-assisted Auger recombination is stronger in sodium iodide than direct Auger recombination.

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