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Effect of gamma radiation on HTS - present understanding

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HTS magnets employed in fusion plants and high-energy physics experiments will be subjected to significant gamma ray fluxes. Gamma rays ($E > 100$ keV) have energies orders of magnitude more than the binding energies of REBCO lattice ions ($E_b \sim 10$ eV) and Cooper-pairs ($E_b \sim 10$ meV) and are, in principle, therefore capable of altering REBCO microstructure and suppressing superconductivity. The potential of gamma rays to affect the superconducting properties of REBCO has been investigated by researchers since REBCO's discovery. Unfortunately, the literature is inconsistent, with many papers reporting conflicting results. In this presentation, we delve into this literature (focussing on more recent works), present the general understanding on the effect of gamma rays on REBCO, and suggest directions for future work.

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