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eV-Scale Modelling of Low-Energy Backgrounds in Superconducting Tunnel Junctions utilizing GEANT4 and G4CMP

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The BeEST experiment searches for physics beyond the standard model (BSM) in the neutrino sector by utilizing the electron capture (EC) decay of 7Be. The 7Be is embedded in superconducting tunnel junction (STJ) sensors such that the low-energy (eV-scale) radiation is detected with high energy resolution and efficiency. Modelling of low-energy backgrounds is crucial to understanding potential beyond standard model (BSM) physics, including low-energy phonon and quasiparticle generation within the superconductors. In this talk, current modelling of these features and corresponding challenges for the BeEST experiment will be discussed with aims towards gaining feedback from the GEANT4 expert community.

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