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Large-scale beta and double-beta decay computations in quasiparticle random-phase approximation MIKA MUSTONEN, JONATHAN ENGEL, The University of North Carolina at Chapel Hill — The quasiparticle random-phase approximation (QRPA) has traditionally been one of the main tools for evaluating double-beta-decay matrix elements. We recently studied four experimentally important double-beta decays—those of ^{76}Ge, ^{130}Te, ^{136}Xe, and ^{150}Nd—with a massive QRPA calculation built on top of a self-consistent Hartree-Fock-Bogoliubov mean field allowing for axial deformation. Our results and challenges arising from the limitations of the approach are discussed, as well as our ongoing work to improve the speed and flexibility of large-scale QRPA calculations for charge-changing processes, such as beta decay, by the Finite Amplitude Method.

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