Main 2-quasiparticle excitations in QRPA: a theoretical support to ALTO-RIB findings

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Abstract. The Quasiparticle Random Approximation (QRPA) allows to describe a wide range of nuclear phenomena from low collective vibrational states to giant resonances, resulting from any (dipole, quadripole, octupole, etc) electromagnetic excitation. This coherent and parameter-free approach, based on a mean-field approach (here, built on top of Hartree-Fock-Bogoluybov solutions obtained with the Gogny Force) can be applied to nearly all the nuclides of the chart, even or odd, including superheavy nuclei [1, 2, 3]. The phonon excitations of the QRPA are built on a coherent summation of 2-quasiparticle (2-qp) excitations. The analysis of the main 2-qp contributions to a phonon excitation allows to get an insight into the nuclear structure properties behind the observed phenomena. In this talk, I will present graphic representations issued from 2-qp analyses of some characteristics QRPA excitations, with a focus on the N=50 neutron-rich mid-mass Ge isotopes targetted by the ALTO-RIB research program. Our QRPA calculations have recently provided a theoretical support to unexpected experimental findings in ^{83}Ge [4].

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