Contribution ID: **116** Type: **Poster Contribution**

Complexities in 3QP Coriolis Mixing Calculations

In present paper, we explored various complexities involved in three-quasiparticle (3QP) Coriolis mixing calculations [1]. The major issues involved in these calculations are:
a)The parallel and anti-parallel coupling of projections of angular momenta of three valence particles on nuclear symmetry axis leads to four different band-heads and hence four different rotational bands for a given 3QP configuration [2]. Thus, even for a small number of 3QP configurations, the basis space of interacting bands become large and hence enhance the complexity of calculations.
b)Since experimental data for 3QP bands is still scarce so that the band-head energies of most the important bands taking part in the Coriolis mixing are not known.
c)The sign of the Newby shift, one of the important input parameter used in 3QP calculations, is still an open problem.
In order to resolve above said complexities involved in 3QP Coriolis mixing calculations we used empirical version Three-Quasiparticle plus Rotor Model [1]. In these calculations we only considered 3QP bands containing low- orbitals and hence leads to a relatively small basis space. The band-head energies of various interacting bands are estimated using known properties of the involved one-quasiparticle (1QP) configuration from the neighboring odd-A nuclei [3]. The Newby shifted energies are estimated using approach of Sood and Ray [4] for odd-odd nuclei. In present study, we successfully explained the experimentally observed staggering pattern in some 3QP bands based on low- orbitals using axially symmetric Three-Quasiparticle plus Rotor Model.

Summary

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