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Title: **Effects of neutron-proton interaction in doubly odd deformed nuclei.**

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The two most important effects associated with the residual n-p interaction in doubly odd deformed nuclei are the Gallagher-Moszkowski splitting and the odd-even or Newby shift. Further information on the neutron-proton interaction may be obtained by studying the odd-even staggering in $K \neq 0$ bands; in fact, the main mechanism responsible for this effect is the mixing, through the Coriolis interaction, of $K \neq 0$ bands with one or more Newby-shifted $K = 0$ bands.

We have investigated the effects of the neutron-proton interaction in doubly odd deformed nuclei, with particular attention focused on the role of the tensor force, by studying the doubly odd Lu isotopes within the framework of the particle-rotor model. The results of our calculations lead to the conclusion that the tensor force as well as the space-exchange and spin-spin space-exchange forces play an important role in the description of $K = 0$ bands and of some $K \neq 0$ bands. [1, 2].

We are currently extending our study to other doubly odd deformed nuclei. In this presentation we shall report on results for Ta isotopes.

References

[1] A. Covello, A. Gargano, and N. Itaco, Phys. Rev. **C56**, 3092 (1997).

[2] N. Itaco, A. Covello, and A. Gargano, *6th International Spring Seminar on Nuclear Physics, Sant'Agata sui Due Golfi, 1998*, ed: A. Covello, (World Scientific, Singapore, 1999), p.451.

Preferred presentation of the contribution: in the oral session.