

THE ROLE OF PAIRING MODES IN THE MULTIPLYET STRUCTURE OF  $^{209}\text{Bi}$ P.F. Bortignon<sup>1</sup>The Niels Bohr Institute, University of Copenhagen, Copenhagen,  
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The multipole surface and pairing vibrations and the particle and hole proton states around  $^{208}\text{Pb}$  are utilized as building blocks to construct the  $^{209}\text{Bi}$  spectrum. This is carried out in the framework of nuclear field theory. In the case of pairing fields, a multipole pairing force with constant matrix elements was diagonalized (RPA), adjusting the coupling strengths to reproduce the experimental energies. The particles and holes were allowed to move in the  $N=2-10$  shells for neutrons and in the  $N=1-9$  shells for protons,  $N$  being the harmonic oscillator principal quantum number. In the case of surface phonons, a multipole particle-hole interaction containing both isoscalar and isovector components was diagonalized. Utilizing the calculated particle-vibration and four-point vertices coupling strengths and free field energies the effective matrix elements were worked out, and the energies and wave functions of the multiplet states calculated. Using these amplitudes the inelastic transition probabilities and the proton pick-up and stripping spectroscopic factors were calculated. The important role of the pairing phonon multiplet is demonstrated, and good agreement with the experimental data achieved<sup>1</sup>.

Reference

1. P.F. Bortignon, R.A. Broglia, D.R. Bes, R. Liotta and V. Paar, Phys. Lett. 64B (1976) 24

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