

A NOVEL APPROACH FOR ODD-ODD NUCLEI APPLIED TO PROTON EMITTERS

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The particle rotor model is widely used and quite successful for a long time, in explaining the observed rotational spectra of several nuclei [1, 2]. Microscopic theories for proton emission utilizing this approach is regarded as one among the most robust and successful approaches [3, 4]. So far, the rotation particle coupling has been carried out only in a constant or variable moment of inertia approximation for odd-odd nuclei. We put forth a new formalism, named as the coupling matrix approach. The core idea of this formalism is based on the coupled channels approach for odd-even nuclei suggested in the work of Bohr and Mottelson and of Esbensen and Davids[5]. As an application the phenomenon of rotational alignment in odd-odd nuclei will be discussed. The results for the proton emission from ^{170}Au will be discussed, highlighting the importance of the coupling matrix approach when the energy levels of the core deviate from that of a rigid rotor.

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