

Search for tetrahedral states in Yb nuclei with N=90 through Coulomb excitation using HIE-ISOLDE and Miniball

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The ^{160}Yb nucleus ($Z=70$ and $N=90$) is double-magic with respect to the predicted Tetrahedral symmetry. Even if already studied in heavy-ion induced reactions, neutron spallation and β -decay, the non-yrast low-spin states and their properties are not well known. In particular it is not clear if a 3- state exists in ^{160}Yb , which could belong to the tetrahedral band. We propose to study the properties of the low-spin states in the radioactive nucleus ^{160}Yb by Coulomb excitation using the HIE-ISOLDE facility and the Miniball array. We also like to study for the first time through Coulomb excitation the $^{162,164,166}\text{Yb}$ isotopes. The information acquired from the experiment will give important insights into the X(5) symmetry predicted for the N=90 nuclei, into the CBS (confined β -soft) rotor model which describes the transition between X(5) and the rigid rotor limit, and the existence of mixed symmetry states. These different phenomena and their manifestation in the Yb nuclei will be discussed.

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