Contribution ID: **35** Type: **Presentation**

Proton Intruder State in ^{13}B

Saturday, 5 April 2008 12:00 (20 minutes)

We have measured the proton transfer reaction of ^{4}He(^{12}Be,^{13}Bγ) with "Gamma-Ray detector Array with Position and Energy sensitivity (CNS-GRAPE)" in RIKEN.
Analyzing the angular differential cross section, we assigned the J^{π} of 4.83~MeV excited state to be $1/2+$ with $C^2S = 0.2$, for the first time.
This state is interpreted as a proton intruder state from the sd shell.
A shell model calculation with an interaction including the effect of the tensor force cannot represent this state, while the deformation explains its low excitation nergy and spectroscopic factor. The observed proton intruder state shows the change of the proton shell structure and indicates the importance of the deformation.

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Session Classification: Exotic Deformation

Track Classification: Collectivities and shell effects in neutron/proton-rich nuclei