



独立行政法人理化学研究所 仁科加速器研究センター
第26回RIBF核物理セミナー

RIKEN Nishina Center for Accelerator Based Science
The 26th RIBF Nuclear Physics Seminar

α 非弾性散乱による ^{12}Be のクラスター状態の研究

Exotic cluster states in ^{12}Be via α -inelastic scattering

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The excited states in the neutron-rich nucleus ^{12}Be were experimentally investigated via α inelastic scattering. The excited states in the ^{12}Be nucleus has been populated by an α -inelastic scattering on ^{12}Be at 60A MeV in the inverse kinematics, and identified by measuring a $^6\text{He}+^6\text{He}$ breakup channel in coincidence. The differential cross section, angular correlations between the decay particles were obtained for each excitation energy from 10 MeV to 20 MeV, reconstructed by the measured momentum vectors of the two ^6He 's.

A multipole decomposition analysis (MDA) based on the distorted wave Born approximation was extensively applied for the angular distribution of the inelastic scattering together with the angular correlation between the decay particles with respect to the directions of the incident beam and to the momentum transfer simultaneously.

From the decomposed excitation energy spectra for $L=0, 2$, and 4 , new excited states with $J^\pi=0^+$ and $J^\pi=2^+$ were identified. According to their similar energy spacings in $J=0$ and $J=2$, these excited states may be possibly forming rotational bands with almost same large moments of inertia corresponding to $\hbar^2/2\mathcal{I}=140$ keV. The structures of the observed states are discussed with predictions of theoretical models such as the antisymmetrized molecular dynamics.

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The seminar will be given in English

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