クラスター階層セミナー Cluster-Hierarchy Seminar

Clusters & Hierarchies

High-Momentum Correlated Nucleons and Tensor Blocking Effects Determine the Shell Structure in Neutron Rich Nuclei

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Date: 13:30-15:00, Apr. 13 (Sat.), 2019.

Place: Room 3-45, 3rd Floor, Main Bldg.,

O-Okayama Campus, Tokyo Institute of Technology (大岡山キャンパス本館３階3-45)

http://info.phys.sci.titech.ac.jp/access.html

http://info.phys.sci.titech.ac.jp/english/trave_info.html

Abstract:

A new paradigm for nuclear structure that includes blocking effects of tensor interactions is proposed. All of the recently discovered magic numbers (N=6, 14, 16, 32 and 34) in neutron-rich nuclei can be explained by the blocking effects. A large amount of binding energy is gained by high-momentum correlated pairs of nucleons produced by the tensor interaction. Such tensor correlations strongly depend on the configuration space available for exciting the 2p-2h states. When additional neutrons occupy a new orbital, the previously available configuration may be lost, resulting in a sudden loss of binding energy otherwise gained by the 2p-2h excitation. Such tensor blocking effects enlarge the energy gaps at all observed new magic numbers. Tensor blocking also explains consistently the observed peculiar configurations of neutron-rich nuclei at the borders of shells.

In the present talk present status of tensor correlations in nuclei will be introduced firstly. Then a new model of nuclei, Tensor Blocking Shell Model, will be introduced and be used to explain new magic numbers, break down of traditional magic numbers, and other peculiar phenomena observed in neutron rich nuclei.

The seminar is given in English.

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