[RIBF-ULIC-Symposium-003] Further understanding of 'Island of Inversion' via nuclear moments and inelastic reactions.

Report of Contributions

Contribution ID: **1** Type: **not specified**

Introduction

Monday 20 December 2010 10:20 (10 minutes)

Presenter: Dr YOSHIDA, Kenichi (RIKEN Nishina Center)

Contribution ID: **2** Type: **not specified**

Study of the island of inversion through nuclear-moment measurements

Monday 20 December 2010 10:30 (30 minutes)

Presenter: Dr UENO, hideki (RNC)

Contribution ID: **3** Type: **not specified**

Pairing and deformation in nuclei around the island of inversion

Monday 20 December 2010 11:00 (30 minutes)

I discuss the role of pair correlations on the electric quadrupole moments of aluminum isotopes around N=20 within the framework of the microscopic particle-vibration coupling model where the pairing and deformation are taken into account. The low-lying vibrational modes in neutron-rich magnesium isotopes are also discussed with paying attention to the pairing and deformation.

Presenter: Dr YOSHIDA, Kenichi (RIKEN Nishina Center)

Contribution ID: **4** Type: **not specified**

Shell-model study on the island of inversion: what has been clarified and what should be

Monday 20 December 2010 11:30 (30 minutes)

I would like to survey the structure around the inland of inversion from the viewpoint of the shell model. I will focus on the interplay of the shell gap which is varying with increasing proton number and the resulting many-body structure. It will be shown that the electromagnetic moment and the reaction cross section are used as useful tools for investigating the structure.

Presenter: Dr UTSUNO, Yutaka (JAEA)

Contribution ID: **5** Type: **not specified**

Studies of neutron-rich nuclear structures through beta-delayed decay of spin-polarized isotopes

Monday 20 December 2010 13:30 (30 minutes)

Much attention has been paid on the exotic structure of neutron-rich nuclei such those around magic numbers N = 8 and 20.
However, most of the information on the excited states of these nuclei, such as spin and parity, has not been known well. We have developed a new method to effectively investigate the level structure by taking advantage of asymmetric beta-decay of spin polarized unstable nuclei: The spins of the daughter states can be assigned unambiguously from the characteristic asymmetry.

We have started beta-delayed decay spectroscopy at ISAC-1 TRIUMF, where highly polarized radioactive nuclear beams are available.
In the first experiment measuring beta-delayed neutron decays of spin-polarized 11Li has successfully assigned the spins and parities of 7 levels in 11Be for the first time [1].

The experiment with polarized 28Na and 29Na beams have been performed in 2007. The beta-decay asymmetry parameters and gamma-ray intensities have also assigned spin-parity of a newly found level in 28Mg and of 7 levels in 29Mg for the first time. The observed levels and log-ft values were compared with the shell model calculations using NuShell code with USD interactions. The level energies, log-ft values and the decay properties of all the assigned levels were explained well by assuming sd-shell configurations. However, in 29Mg two levels at 1.095 and 1.430 MeV associated with large log-ft values could not be reproduced by the calculations. The Monte Carlo Shell Model calculation taking into account the intruder configurations predicted 3/2- and 7/2- levels around 1 MeV [2]. This fact strongly suggests negative parity assignments for the 1.095 and 1.430 MeV levels in 29Mg.
In August 2010 the experiment with 30Na beam has been performed and the data analysis is in progress now.

In the talk the principle of the method will be introduced and results on the 11Be, 28Mg and 29Mg structures will be discussed. Some of new findings on 30Mg structure will also be presented.

[1] Y. Hirayama et al., Phys. Lett. B611, 239 (2005).
[2] Y. Utsuno, private communication.

Presenter: Prof. SHIMODA, Tadashi (Department of Physics, Osaka University)

Contribution ID: **6** Type: **not specified**

Spectroscopy in the Island of Inversion studied by AMD and perspectives

Monday 20 December 2010 14:00 (30 minutes)

Spectra and transitions in the Island of Inversion is reviewed based on the AMD calcualtions.
To discuss the single particle nature, the odd-mass system will be focused. The possible presence of the exotic structure such as halo and clustering will be mentioned.

Presenter: Dr KIMURA, Masaaki (Hokkaido University)

Contribution ID: **7** Type: **not specified**

Structure study of nuclei in and around the island of inversion by γ-ray measurement at RIPS and BigRIPS

Monday 20 December 2010 14:30 (30 minutes)

Presenter: Dr AOI, Nori (RIKEN, Nishina Center)

Contribution ID: **8** Type: **not specified**

Shape coexistence/mixing in Mg isotopes

Monday 20 December 2010 15:00 (30 minutes)

Properties of the low-lying states in magnesium isotopes around the island of inversion are studied using the five-dimensional quadrupole collective Hamiltonian constructed with the microscopic theory of large-amplitude collective motion.
Shape dynamics with changing the neutron number and angular momentum in the yrast bands are discussed.
The properties of the experimental observables such as the 0_2^+ states, 2_2^+ states, excited rotational bands, electric transitions between yrast and excited bands, and quadrupole moments are also discussed in relation with the shape coexistence/mixing dynamics.

Presenter: Dr HINOHARA, Nobuo (RIKEN Nishina Center)

Contribution ID: **9** Type: **not specified**

A new theory on nucleon removal reaction

Monday 20 December 2010 16:00 (30 minutes)

I present a new theory to treat inclusive reactions accurately. This theory is more accurate than the Glauber model widely used.

Presenter: Prof. YAHIRO, Masanobu (Kyushu University)

Contribution ID: **10** Type: **not specified**

Application of the eikonal reaction theory to 31Ne indeuced reaction

Monday 20 December 2010 16:30 (30 minutes)

The eikonal reaction theory is a new theory to treat inclucive reactions accurately. I show the application of this theory to 31Ne induced reaction.

Presenter: Mr MINOMO, Koshou (Kyushu University)

Contribution ID: **11** Type: **not specified**

Mechanism for nuclear and Coulomb breakup reactions

Tuesday 21 December 2010 09:30 (30 minutes)

Breakup reactions have played key roles in investigating properties of unstable nuclei. One of the most reliable methods for treating projectile breakup processes is the method of continuum-discretized coupled channels (CDCC). CDCC has successfully been applied to analyses of three-body breakup system, in which the projectile breaks up into two constituents. Recently, we have developed CDCC to treating four-body breakup reactions with three-body projectile. Thus CDCC is very useful for systematic analyses of scattering including light unstable nuclei, which have exotic properties such as the halo structure and the island of inversion.

In this talk, I will report results of analyses for 11Be, 15C, and 6He breakup reactions with nuclear and Coulomb interactions, and discuss for those structure properties and reaction mechanisms.

Presenter: Dr MATSUMOTO, Takuma (RIKEN Nishina Center)

Contribution ID: **12** Type: **not specified**

Coulomb breakup of neutron-rich nuclei around the island of inversion

Tuesday 21 December 2010 10:00 (30 minutes)

Presenter: Prof. NAKAMURA, Takashi (Tokyo Institute of Technology)

Contribution ID: **13** Type: **not specified**

Reactions of 31Ne in the Glauber model

Tuesday 21 December 2010 11:00 (30 minutes)

Presenter: Prof. SUZUKI, Yasuyuki (Niigata University)

Contribution ID: **14** Type: **not specified**

Interaction Cross Sections for Ne and Na Isotopes towards the island of Inversion

Tuesday 21 December 2010 11:30 (30 minutes)

Presenter: Dr TAKECHI, Maya (RIKEN Nishina Center)

Contribution ID: **15** Type: **not specified**

Seminar

Tuesday 21 December 2010 13:30 (1h 30m)

Contribution ID: **16** Type: **not specified**

Discussion

Tuesday 21 December 2010 15:00 (1h 30m)

Contribution ID: **17** Type: **not specified**

Summary

Tuesday 21 December 2010 16:30 (30 minutes)

Presenter: Dr KIMURA, Masaaki (Hokkaido University)

Contribution ID: **18** Type: **not specified**

(no title)