67th OMEG-SSANP Workshop

Time : 5 April (Wed) 2023 3:00-6:00 pm

Place : Soongsil University Baird Hall 324

Time	Title	speaker
14:30-15:00	Registration	
15:00-15:50	Pair correlations and two-neutron transfer reactions	Kouichi Hagino
15:50-16:40	Magnetic dipole transitions of Sn isotopes and tensor interactions	Hiroyuki Sagawa
16:40-17:00	Break time	
17:00-17:50	Odd-even staggering and Kink structures of charge radii of Hg isotopes by DRHBC mass model	Myung-Ki Cheoun

OMEG
Origin of Matter and Evolution of Galaxies
우주 물질 중점연구소

[1]

Title: Pair correlations and two-neutron transfer reactions

It has been well recognized that two-neutron transfer reactions are sensitive to the pair correlations of colliding nuclei. I will discuss to what extent these reactions can be considered to be a direct probe of the pair correlation. To this end, I will present results of a simple one-dimensional 3-body model calculation. I will also discuss the relation between the isovector particle-hole correlation and deuteron transfer reactions.

[2]

Title: Magnetic dipole transitions of Sn isotopes and tensor interactions

The magnetic dipole (M1) resonances of even-even $^{112-120, 124}$Sn isotopes are investigated in the framework of the self-consistent Skyrme Hartree-Fock (HF) + BCS and quasiparticle random phase approximation (QRPA). The Skyrme energy density functionals with and without tensor interaction are adopted in our calculations. The mixed type pairing interaction is used to take care of the pairing effect for open-shell nuclei both in the ground and excited states calculations. The calculated magnetic dipole strengths are compared with available experimental data. The QRPA results with tensor force show a better agreement with the experimental data than those without the tensor force. We discuss the effect of tensor force on the M1 resonance in detail. It is found that the M1 resonance is sensitive to the tensor interaction.

Depending on the nucleus, a quenching factor of the M1 operator of about 0.71-0.95 is needed to reproduce the total observed transition strength.

In our calculations, we also find some low-lying, pygmy-type magnetic dipole states distributed below 6.0 MeV.

[3]

Title: Odd-even staggering and Kink structures of charge radii of Hg isotopes by DRHBC mass model

We discuss the odd-even staggering (OES) of charge radii of Hg isotopes, which are recently confirmed by advanced laser techniques, using the deformed relativistic Hartree Bogoliubov con tinuum (DRHBc) model for nuclear structure. We found that the OES of 180—186Hg isotopes is attributed to the shape coexistence of the Hg isotopes. In particular, prolate shapes of 181,183,185Hg give rise to the increase of the charge radii compared to the other oblate even-even 180,182,184,186Hg isotopes stemming from the shape coexistence. In addition, we also present the kink structure of the charge radii of the Hg isotopes in the vicinity of N = 126 shell with detailed discussions of the shell evolution of neutron single particle states of Hg isotopes.