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Study of Gamow-Teller Transition on He-4 with PANDORA

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Gamow-Teller(GT) transition is one of the basic excitation modes in nuclei. Though these kind of excitation modes are well studied on stable nuclei, data on exotic nuclei are still lacking. Due to the high isospin asymmetry [(N-Z)/A] of neutron dripline nuclei, the energy gain of GT resonance of these nuclei is expected to be enhanced. In addition, ⁶He is a halo nucleus, it's neutron halo can be regarded as pure neutron matter. GT transition measurement on ⁶He may extend our knowledge on spin-isospin collectivity to very exotic nuclear matter.

Inverse kinematics gives us chance to study unstable nuclei. Neutrons of ⁶He(p,n)⁶Li reaction were measured to reconstruct missing mass spectra. Because both photon and neutron have no charge, it's hard to distinguish them for traditional detectors. The random gamma-ray background can be a big problem for neutron measurement. So a new detector system, PANDORA(Particle Analyzer Neutron Detector Of Real-time Acquisition), was developed to discriminate neutron events and reduce the gamma background.

Performance of the neutron-gamma discrimination and some preliminary results of the experiments will be shown in the poster.

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