

Experimental study of $4n$ with $8\text{He}(p,2p)$ reaction

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We will present our recent study of tetraneutron($4n$) by using the $8\text{He}(p,2p)$ reaction with inverse kinematics, which was performed at RIKEN RIBF facility in 2017.

Many-neutron systems, in particular the tetraneutron, have attracted lots of attention in the last decades. Their existence of itself, whether as bound or resonant state, is of fundamental importance in nuclear physics, serving as a sensitive probe to investigate the nuclear force free from Coulomb interaction. However, no unambiguous conclusion could be drawn from the experimental data reported by far because of the extremely low statistics.

We have carried out new measurement on tetraneutron by using $8\text{He}(p,2p)^7\text{H}\{t+4n\}$ reaction with inverse kinematics at RIBF. Neutrons were detected by NeuLAND demonstrator from GSI and NEBULA array, which can provide the highest 4-neutron detection efficiency($\epsilon_{4n}\sim 1\%$) at present.

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