

Abstract Submitted
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tetra neutron system studied by exothermic double-charge exchange reaction ${}^4\text{He}({}^8\text{He}, {}^8\text{Be})4\text{n}$ KEIICHI KISAMORI, Center for Nuclear Study, the University of Tokyo, SHARAQ06 COLLABORATION — A possible existence of the tetra-neutron system as a resonance state is still an open and fascinating question, while theoretical papers using ab-initio calculation suggests that the bound tetra-neutron does not exist. We have performed a missing-mass spectroscopy of the 4n system via the exothermic double-charge exchange reaction ${}^4\text{He}({}^8\text{He}, {}^8\text{Be})4\text{n}$. The experiment was carried out at the RIBF at RIKEN using the SHARAQ spectrometer and the liquid He target system. Since the secondary beam, ${}^8\text{He}$ at 190A MeV, has a large internal energy, it is possible to produce the 4n system in small momentum transfers of less than 20 MeV/c. In the present analysis, a new analytical framework to treat multi-particles under high beam rate condition (2 MHz) was developed for good statistics. At the SHARAQ spectrometer, ${}^8\text{Be}$ can be identified by measuring the invariant mass of the coincident two-alpha particle with a good signal-to-noise ratio. About several tens of candidate events are obtained above the 4n threshold. We will show the preliminary result of missing-mass spectrum and discuss the shape of spectrum.

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