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Deformed halo nuclei observed thorough the reaction cross sections measurements for Ne and Mg isotopes to the vicinity of neutron-drip line

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During the past several tens of years, our knowledges about the features of exotic nuclei have been much enhanced. In 1980s, neutron halo structure of neutron drip-line nucleus, which is one of the most notable abnormal features of exotic nuclei, have been found. In 1990s, the vanishing of the $N = 20$ magic number for neutrons have been more extensively studied and discussed in so-called “island of inversion” region.

In this presentation, precise reaction cross section data which have been recently measured at RIKEN, RI-beam Factory using BigRIPS fragments separator for $^{20-32}\text{Ne}$ and $^{24-38}\text{Mg}$ will be reported. The deformation features of Ne and Mg isotopes in the island of inversion and the possible “deformed halo” structure in $^{29, 31}\text{Ne}$ and ^{37}Mg will be presented from our data and the analysis with the microscopic double-folding model (DFM) and anti-symmetrized molecular dynamics (AMD) calculation.

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