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論文題目: New insight into α clustering from knockout reaction analysis
　（ノックアウト反応解析によるアルファクラスター現象への新たな知見）
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論文要旨：

　The nuclear clustering is one of the interesting phenomena in the nuclear physics. A typical nuclear units as a cluster is the α particle.　The models for describing the cluster states have been developed for decades and various cluster states are found in the light mass region. However, their existence and the universality throughout the nuclear chart have not yet been confirmed enough, the clustering in the ground states in particular.

　In order to quantify how the α cluster state is spatially developed via nuclear reactions, the peripherality of the reaction is important. In this point of view, the proton induced α knockout reaction, ($p,p\alpha$), have been investigated as a probe for the α cluster states. The ($p,p\alpha$) from ^{10}Be, ^{20}Ne, and ^{120}Sn have been studied in this thesis. As a result, it has been shown that the α knockout reaction is very peripheral for the wide range of the target mass, and can be utilized as a probe for the α clustering. Moreover, a new concept named the masking function, which quantitatively defines the probed region through the reaction, is introduced.

　For describing the ($p,p\alpha$) reactions, the distorted wave impulse approximation (DWIA) is adopted. The validation of the DWIA framework have been done by the benchmark comparison with more sophisticated reaction theories: the transfer-to-the-continuum model and the Faddeev/Alt-Grassberger-Sandhas theory.