

Structures of neutron drip line nuclei studied by inclusive breakup reactions at ZDS

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The breakup reactions of neutron rich nuclei near $N=20$ and $N=28$ have been measured with C and Pb targets at about 240 MeV/nucleon at the ZDS spectrometer at RIBF. The breakup with a light target is induced primarily by the nuclear interaction, which is sensitive to the single-particle state of the removed neutron. The gamma ray detected by the DALI2 detector in coincidence with the outgoing charged fragment distinguishes whether the initial state is in excited states. The breakup with Pb target is induced mainly by the Coulomb interaction (Coulomb breakup), where the soft E1 excitation for halo nuclei can be identified. We have found that the combination of these breakup reactions can clarify the configuration (spectroscopic factor and separation energy) of the loosely bound nuclei. We discuss also the halo states in ^{29}Ne , ^{31}Ne , and ^{37}Mg , revealed in the experiment.

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