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## The SAMURAI27 experiment: Spectroscopy of $^{31}\text{Ne}$ using breakup reactions

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In November 2016, we performed the SAMURAI27 experiment. The aim is to search for unbound excited states of  $^{31}\text{Ne}$ , a deformed p-wave halo nuclei in the “island of inversion.”

So far its deformation properties have not been experimentally studied with direct methods.

In the present study, we applied the invariant mass method to study the unbound states of  $^{31}\text{Ne}$  in the inelastic scattering reaction  $\text{C}(^{31}\text{Ne},^{30}\text{Ne}+n)$  and one neutron removal reaction  $\text{C}(^{32}\text{Ne},^{30}\text{Ne}+n)$  to produce the excited states.

In addition, we performed the Coulomb breakup reaction  $\text{Pb}(^{31}\text{Ne},^{30}\text{Ne}+n)$  to obtain further properties of the ground state.

In this talk, the experimental setup and the analysis result will be reported.

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