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A new technique to determine gamma emission probability above the neutron threshold without gamma-ray detectors

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Evaluation of the neutron-capture reaction rates on radioactive isotopes is still challenging. Several indirect methods have been proposed to evaluate the cross sections. We recently developed a novel technique to determine the gamma emission probabilities of the unbound states in a nucleus without detecting gamma-rays. By employing the idea of the surrogate reaction, the neutron capture reaction cross section can be evaluated with the gamma emission probability.

We applied the technique to ^{79}Se and ^{130}Sn to evaluate the neutron capture cross section on these nuclei. The experiment was carried out at a new beam line named OEDO which can provide the energy-degraded and focused RI beam at RIBF. The (d,p) reaction was measured in inverse kinematics and outgoing residual nuclei were also measured by the SHARAQ spectrometer in coincidence with the recoiled protons. In this talk, we will introduce the OEDO beam line and discuss the experimental result of ^{79}Se .

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