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Development of beta-gamma spectroscopy for precise measurements of beta-decay branching ratios JUNYA NAGUMO, Department of Physics, Tokyo University of Science, HIMAC H312 COLLABORATION — The ft values for superallowed beta decays yield the most precise value of V_{ud}, the up-down element of CKM matrix. Recently, the ft values for the mirror decays with $T = 1/2$ can be used to extract precise weak interaction information. In these studies, the precise values of branching ratio as well as Q_{EC} and half -life are required. However, it is very challenging to determine the precise branching ratio for the beta-decay feeding to not only excited states but also the ground state. In this determination, the knowledge of a very precise absolute gamma-ray detection efficiency and the counting system of total number of beta decays are required. Therefore, we developed a new system for beta-gamma spectroscopy with high-energy secondary beam. The high-energy secondary beam including beta emitters was implanted in the center of a 6-mm-thick GSO scintillator. The beta rays were measured by the GSO scintillator, which ensured the high beta-ray detection efficiency of nearly 100%. The gamma rays were measured by four clover type germanium detectors installed around the GSO scintillator. The absolute gamma-ray detection efficiency was determined by using other superallowed beta emitters with known gamma-ray intensity in the same condition as the nucleus of interest.

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