

Construction of a renewed $^{33}\text{Mg} \rightarrow ^{33}\text{Al}$ decay diagram

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Neutron-rich nuclei near the neutron number 20 are known to exhibit exotic structure, such as shape deformation of their ground states, contrary to a spherical shape expected from the conventional magicity for the neutron shell. The mass region is called the “island of inversion” and a variety of experimental works has been devoted to study it. To unravel the mechanism to generate the “island of inversion”, we have systematically studied excited states of neutron-rich Al isotopes by a unique method of the spin-polarized beta-decay spectroscopy, where spins Al levels fed by the beta decay of Mg are experimentally determined without ambiguity. As the first step, we performed an experiment to investigate the level structure of ^{33}Al by using “non-polarized” ^{33}Mg at TRIUMF. In this experiment, the gamma and beta rays were measured by 8 telescopes each consisting of a high-purity germanium detector and a thin plastic scintillator. Based on the analysis of gamma-gamma coincidence and the gamma-ray intensities, we constructed a renewed decay scheme of $^{33}\text{Mg} \rightarrow ^{33}\text{Al}$. The detailed analysis and results will be presented.

Presentation type

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