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Systematic study of neutron-deficient nuclei by beta-decay spectroscopy

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Beta decay has a direct access to the absolute values of the Fermi and Gamow-Teller transition strengths. The comparison with complementary charge exchange reactions, such as the ($^3\text{He,t}$) reaction performed on the mirror stable targets at RCNP Osaka, allows us the investigation of fundamental questions related to the role of the isospin in atomic nuclei. A systematic study of proton-rich nuclei has been carried out by decay spectroscopy experiments with implanted radioactive ion beams (RIBs) at GANIL and RIKEN. We have obtained remarkable results [1-4], among which the discovery of the exotic β -delayed γ -proton decay in ^{56}Zn [1] and the first observation of the 2^+ isomer in ^{52}Co [3]. These studies were extended to higher masses and more extreme nuclear conditions at RIKEN thanks to the high-intensity RIBs available. An overview of the most important results will be presented, together with the new results on ^{60}Ge and ^{62}Ge [4] obtained from the RIKEN experiment.

[1] S.E.A. Orrigo et al., Phys. Rev. Lett. 112, 222501 (2014).

[2] S.E.A. Orrigo et al., Phys. Rev. C 93, 044336 (2016).

[3] S.E.A. Orrigo et al., Phys. Rev. C 94, 044315 (2016).

[4] S.E.A. Orrigo et al., Phys. Rev. C 103, 014324 (2021).

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