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Correcting for β-Summing in β-delayed Proton Detection with Double-Sided Silicon Strip Detectors[1] ZACHARY MEISEL, Michigan State /NSCL, H. CRAWFORD, TRIUMF, G. GRINYER, GANIL, G. LORUSSO, RIKEN, P. MANTICA, M. DEL SANTO, H. SCHATZ, NSCL, JOINT INSTITUTE FOR NUCLEAR ASTROPHYSICS COLLABORATION — In studies of β-delayed proton emission, detection of the proton energy is often of primary interest. However, once deposited in a thick double-sided silicon strip detector, the parent nucleus emits a positron and proton nearly simultaneously. Simulations must be used to determine the amount of energy the positron contributed to the overall energy detected to allow an accurate extraction of the proton energy. We solve this issue, which we call the β-summing effect using GEANT4 for the parent nuclei Mg-20, Si-23, and Kr-69. We find the positron's contribution can significantly impact peak energy for a decay event, leading to an incorrect determination of proton energy. The β-summing primarily depends on implantation depth and weakly on the β-decay's Q-value. We also find the shape of the summing peak can be used to constrain the parent nucleus's implantation depth.

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