

Abstract Submitted
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Development of gain-matching algorithms for a Double-Sided Silicon Strip Detector DAVID SIMPSON, ROBERT GRZYWACZ, University of Tennessee — Proton radioactivity experiments almost exclusively employ the recoil-decay correlation technique which require the use of Double-sided Silicon Strip Detectors (DSSD) [Sellin]. Proper gain matching of detector strips, a basic requirement for such measurements, is of critical importance in “fine structure” experiments [KarnyPRL], where the uncalibrated strips could lead to artificial “discoveries.” Current gain matching techniques done manually on a strip by strip basis are time consuming and require a discrete source of radiation in which to line up the measured values. If performed during experiment, the calibrations interfere with the data taking time. New iterative methods of gain matching have been developed and tested using a computational algorithm that relies only on the requirement of the equality of particle induced signals on the front and back side of the silicon detector. This allows for faster gain matching, and can be used with any external radioactive source, even with continuous energy spectrum, like that generated by any particle radiation detected by the DSSD during the experiment. The algorithms were tested and bench-marked with data taken during recent proton radioactivity experiments at HRIBF.

References:

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Robert Grzywacz
University of Tennessee

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