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Automation and Machine-Learning can help you do more physics sooner SPENCER SHANK, WILLIAM LILLIS, Wabash College, MONA COLLABORATION COLLABORATION — Detector calibration is a task that is critical, mundane, and time consuming. As detector arrays have grown in scale, the tasks required have grown as well. For experiments with the MoNA/LISA neutron detectors it is critical to calibrate the arrays' 576 timing and energy response in order to extract accurate physics data. We will report on methods leveraging automation and machine intelligence to determine calibration parameters, and identify detector elements that require additional attention and/or adjustment from experimenters. We will report on methods using a large number of cosmic-ray tracks to determine relative time offsets of the 288 detector bars, based on a truncated travelling salesman-like approach. Additionally, two methods of determining positions will be explored, one based on the ratio of the scintillation light reaching the two ends of a detector bar, and one using the time difference between the ends. These two methods will be compared, showing that light difference can be used as backup to time difference in some cases, and that specific types of two-neutron events can be distinguished using these parameters and machine learning. These methods can reduce the time taken to calibrate and help one move from calibrations to physics sooner.

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