

A high dynamic range data acquisition system for a solid-state electron Electric Dipole Moment experiment

Young Jin Kim, Brandon Kunkler, Chen-Yu Liu, Gerard Visser

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We have built a high precision (24-bit) data acquisition (DAQ) system with eight simultaneously sampling input channels for the measurement of the electric dipole moment (EDM) of the electron. The DAQ system consists of two main components, a master board and eight individual analog-to-digital converter (ADC) boards. This custom DAQ system provides galvanic isolation, with fiber optic communication, between the master board and each ADC board to reduce the possibility of ground loop pickups. In addition, each ADC board is enclosed in its own heavy-duty radio frequency shielding enclosure and powered by DC batteries, to attain the ultimate low levels of channel cross-talk. In this paper, we describe the implementation of the DAQ system and scrutinize its performance.

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