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Custom digitizers with on-board pulse shape discrimination.

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The digitization of the signals coming from nuclear detectors signals is becoming widespread. In many applications, the digitized signal is also used for the identification of the detected nuclear fragments from pulse-shape related parameters (Pulse Shape Discrimination). In large detector arrays, the data throughput and calculation power required when the full waveforms are transferred to a PC farm for the analysis can be too cumbersome. A possible solution is to distribute the calculation over the single digitizing channels, i.e. extracting the relevant information already on the digitizing board, by using an on-board digital signal processor or a FPGA. This solution has been implemented at the GARFIELD+RCO apparatus, whose digitizing electronics is about to be upgraded.

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