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Development of a high resolution transient recorder

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The GANDALF transient recorder with a resolution of 12bit@1Gsps has been developed to sample analog signal pulses with fast rising edges (3ns) and large dynamic ranges at the COMPASS experiment. Signals are digitized and processed by fast algorithms to extract pulse arrival times and amplitudes in real-time and to generate experiment trigger signals.
With 8 analog channels, deep memories and a high data rate interface, this 6U-VME/VXS module is not only a dead time free readout system but also has huge numerical capabilities provided by the implementation of a Virtex5-SXT FPGA to disentangle possible pile-up pulses and determine timing information with a time resolution in the picosecond range.

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