

## A NEW PULSE-ORIENTED DIGITAL ACQUISITION SYSTEM FOR NUCLEAR DETECTORS

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During the last years an extensive work has been carried out by ENEA to develop a new digital system capable to acquire pulses (generated, for example, by gamma-rays and neutrons in scintillators) at very high speed (200 MSamples/s) and with high dynamic range (14-bit). The prototype of a new concept FPGA-based digital acquisition board has been developed and tested in various nuclear fusion machines and accelerators facilities with neutrons and gamma sources. In addition to the high speed/high dynamic range, a major feature of the system is the DWDA (Dynamic Windows Data Acquisition) technique: the system samples the incoming signal only in presence of a pulse (trespassing a given preset threshold), avoiding to acquire useless data. The new concept is that, in presence of a new pulse in the current acquisition window, the system increases in real time the window length to host the incoming new pulse. In this article an architectural description of the system and the main experimental results are presented.