Development of FPGA-based NIM logic circuits

HIDETADA BABA, RIKEN Nishina Center — We have developed the Generic Trigger Operator (GTO) module for nuclear physics experiments. This is a NIM module aimed at providing intelligent and remote trigger operations. Logic circuits are implemented in field programmable gate array (FPGA) of GTO. NIM logic module like circuits such as fan-in/fan-out, gate, delay, latch, coincidence and scaler have been successfully implemented. One of the advantages of GTO is these logic circuits can be combined into one NIM module as you want. The performance of the time jitter in usual NIM logic modules is very good because of its function is implemented in Emitter-coupled Logic IC. However, the time jitter of GTO depends on the complexity of FPGA circuit implementation. In this contribution, we show functionalities of GTO and its timing performance in comparison with usual NIM logic modules.

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