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Performance and Integration results of a high resolution Time to Digital Converter designed for INO ICAL Experiment

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INO ICAL Experiment emphasis on studying various properties of Atmospheric Neutrinos. A 50 kton Iron Calorimeter and Resistive plate Chamber (RPC) in stacked geometry will be used to track neutrinos. Position and directional information are to be used to identify particle energies. RPC detector signal of rise time less than 1ns is amplified-discriminated and given to Digital Front End (RPC-DAQ). To time these fast pulses we designed a low power, compact multi-channel delay-chain-based time-to-digital converter (TDC) in a 0.13µm ASIC which will be integrated in the RPC-DAQ module. This TDC is capable of handling multiple hits per channel with a single-shot precision better than 65.34ps. A 4 line or 11 line serial peripheral interface (SPI) is used for readout and configuration. This paper presents the performance and integration results of this TDC.

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No, this is an entirely new submission.

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