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HKROC: an integrated front-end ASIC to readout photomultiplier tubes for large neutrino experiments (poster-ID94)

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The HKROC ASIC was originally designed to readout the photomultiplier tubes (PMTs) for the Hyper-Kamiokande (HK) experiment. HKROC is a very innovative ASIC capable of readout a large number of channels satisfying stringent requirements in terms of noise, speed and dynamic range. Each HKROC channel features a low-noise preamplifier and shapers, a 10-bit successive approximation Analog-to-Digital Converter (SAR-ADC) for the charge measurement (up to 2500 pC) and a Time-to-Digital Converter (TDC) for the Time-of-Arrival (ToA) measurement with 25 ps binning. HKROC is auto-triggered and includes all necessary ancillary services as bandgap circuit, PLL (Phase-locked loop) and threshold DACs (Digital to Analog Converters). This presentation will describe the ASIC architecture and the experimental results of the last prototype received in January 2022.

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