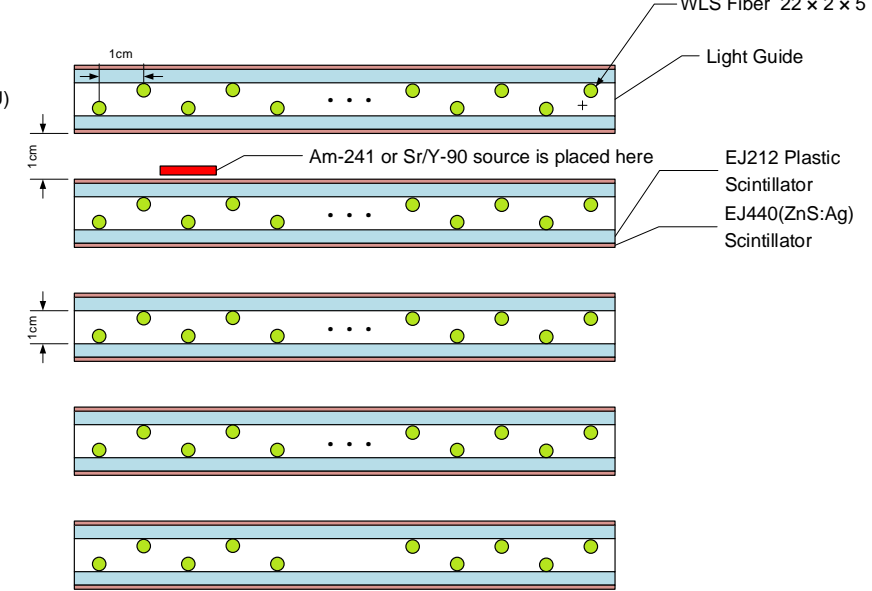
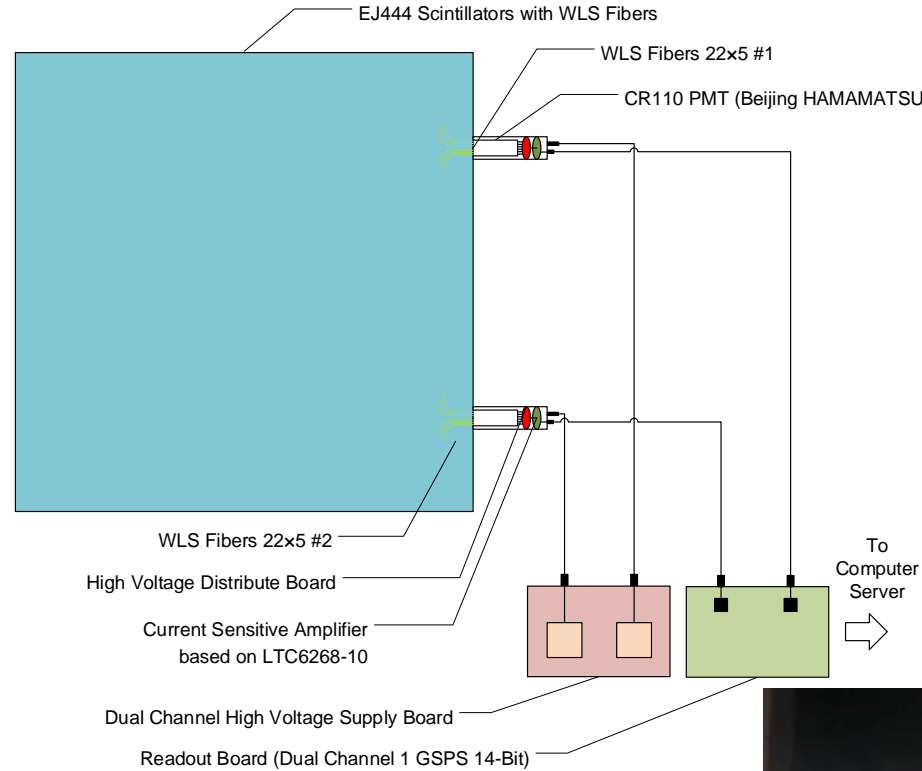


Preliminary Design of a FADC Readout System for the Alpha/Beta Discrimination in a Large Area Plastic Scintillation Detector

Jingjun Wen, Daowei Dou, Jinfu Zhu, Tao Xue, Zhi Zeng

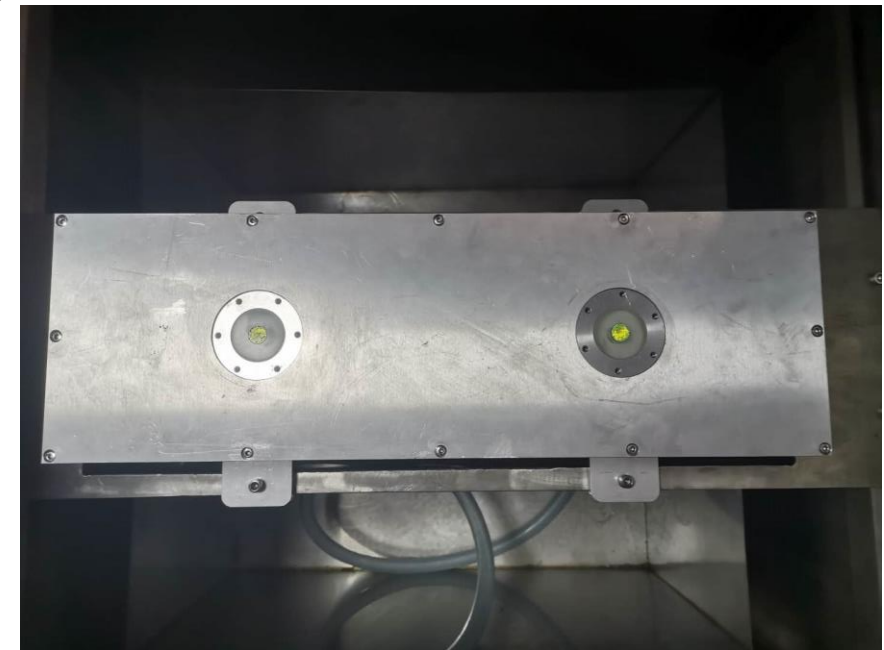
#140

Detector Module



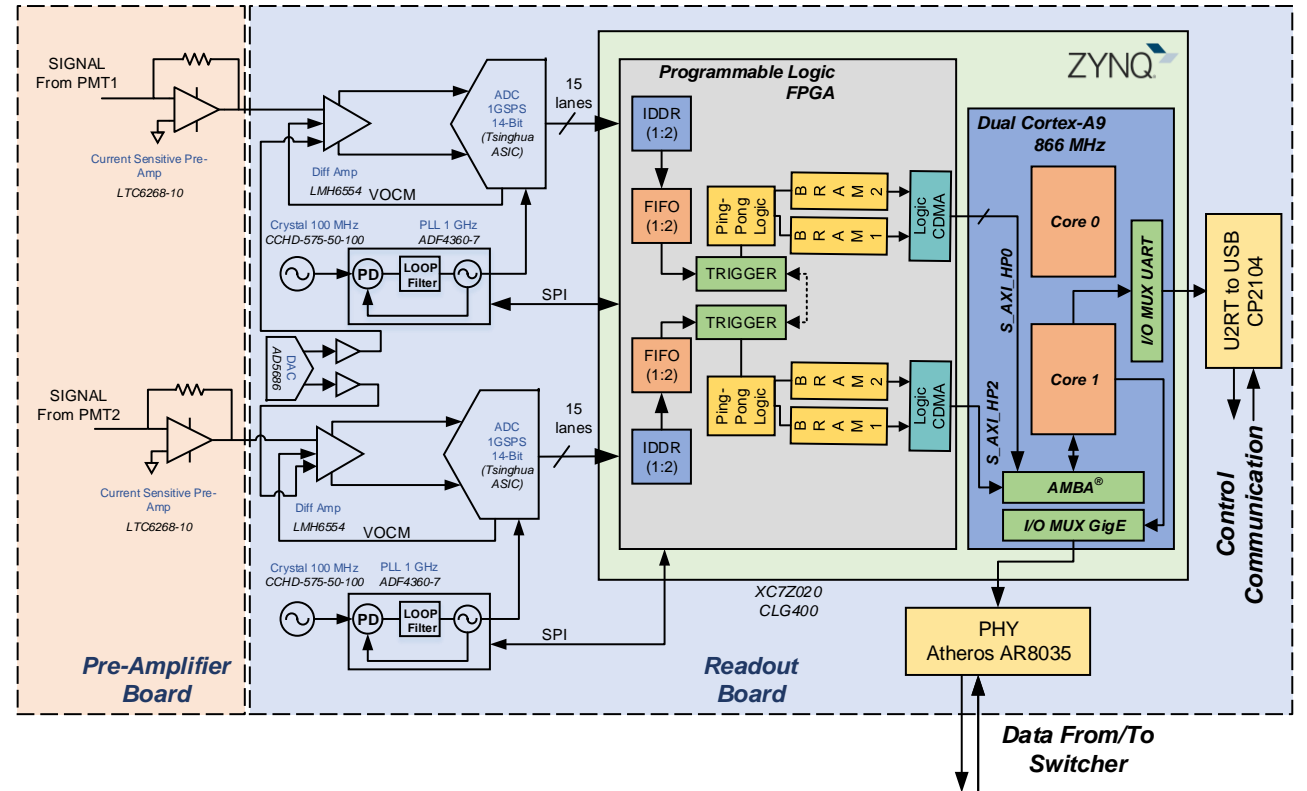
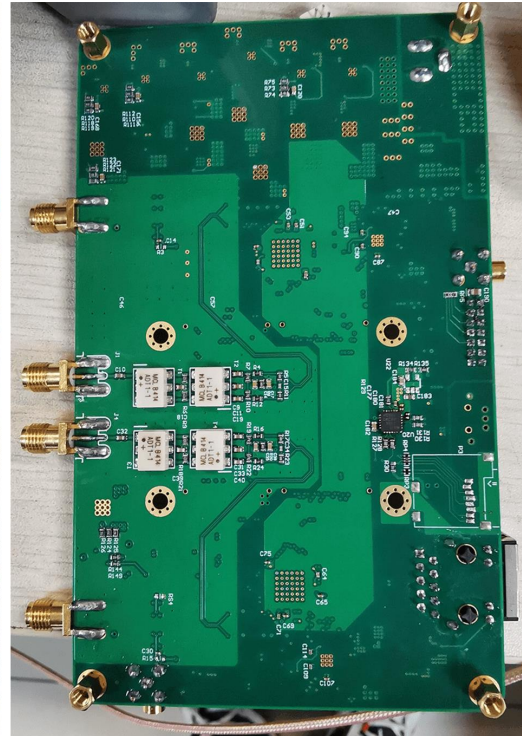
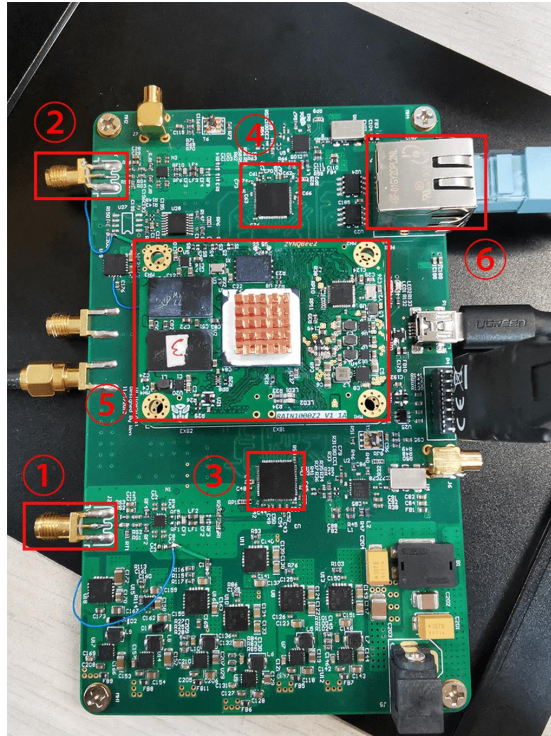
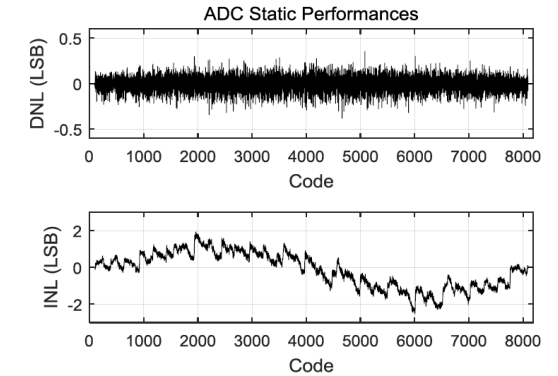
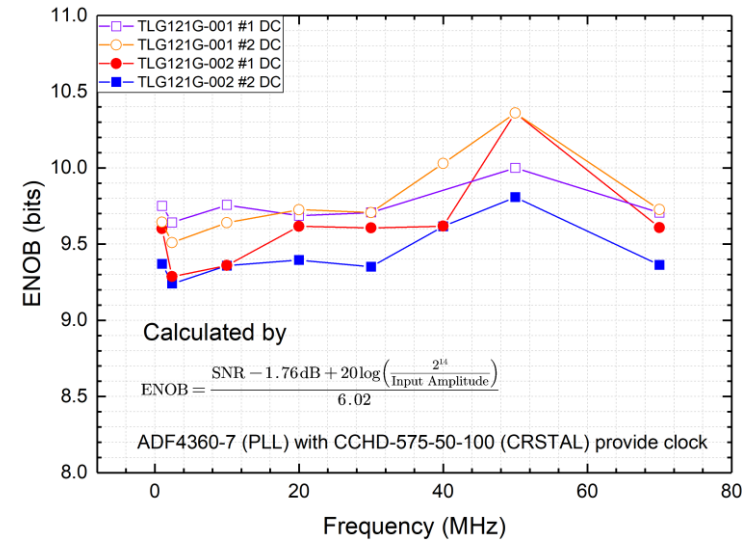
Detector module

Detector module in the water tank



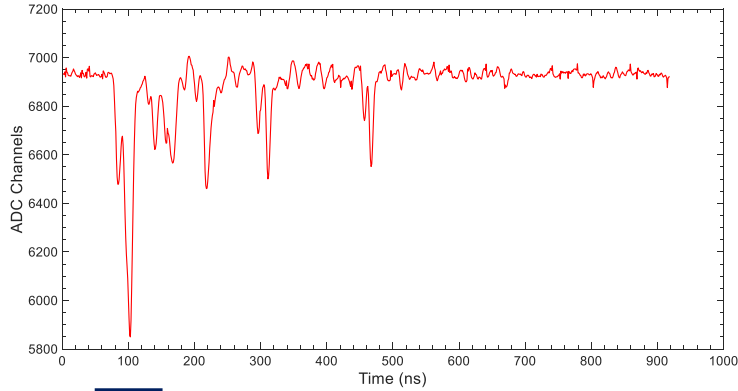
FADC Readout Electronics

Num. of Channels	2
Sampling Rate	1 GSPS
Resolution	14-Bit
ENOB	~9.8 (@10MHz)
Readout Module	XC7Z020 CLG400

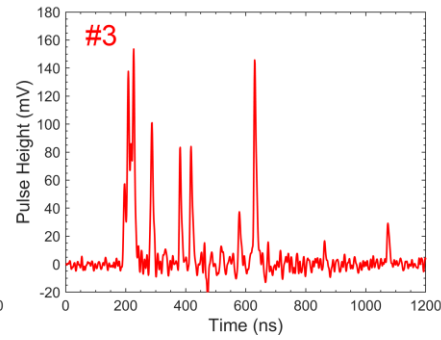
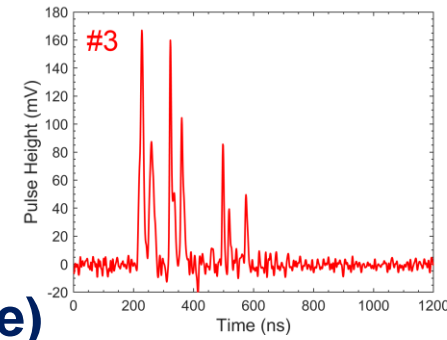
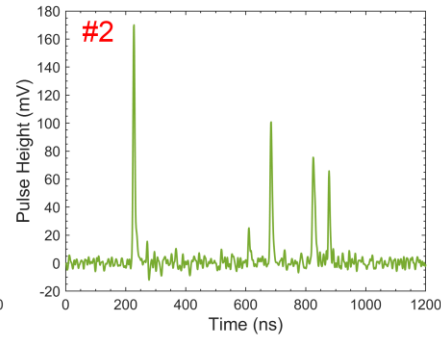
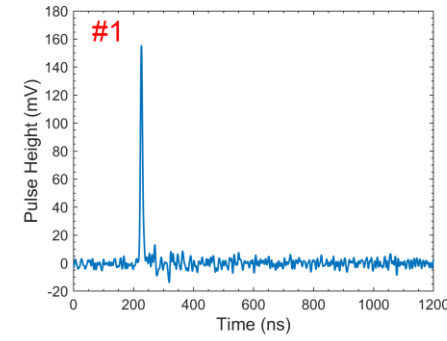
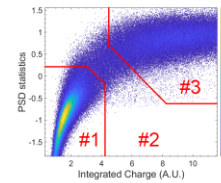
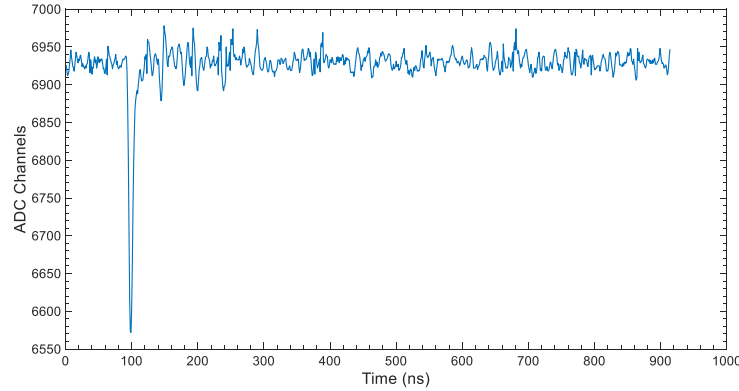


Discrimination Results

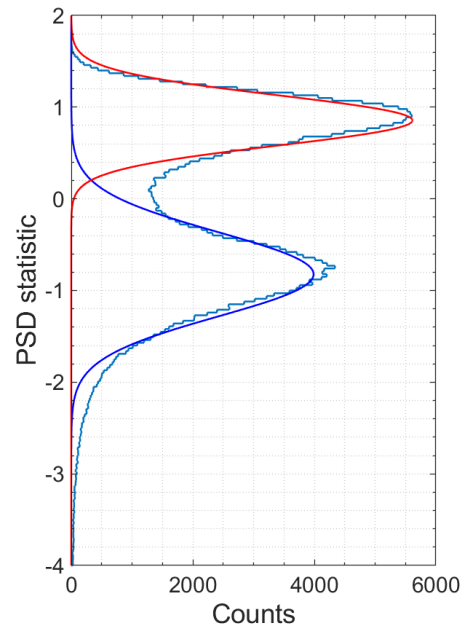
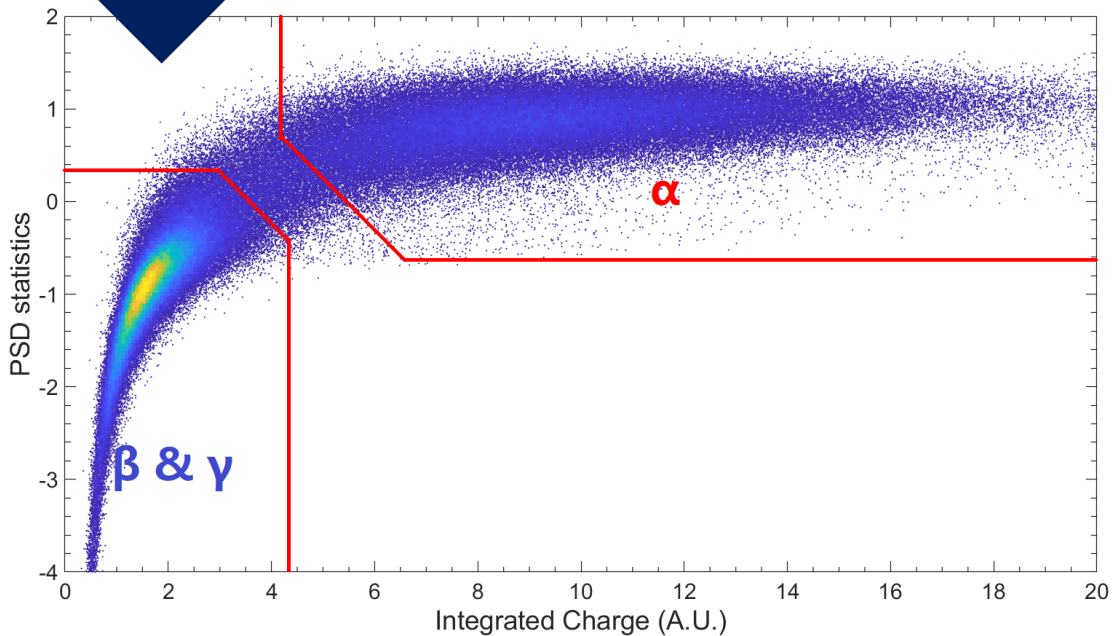
Typical α signal



Typical γ/β signal



Preliminary discrimination results (Based on least-square)



Data from Am-241 experiment

Conclusions

- **Design and validate a dual channel FADC readout system for the tap water α/β dose real-time monitoring system.**
- **The FADC readout system can provide both high sampling (1 GSPS) and optimum ENOB (9.7 Bits at 10 MHz).**
- **The system is based on a ZYNQ SoC module (ZynqBee2), which provides both high data throughput and excellent flexibility.**