



Contribution ID: 145

Type: **Poster**

## The VRP - a Versatile Readout Platform for the nuclear experiments at HIRFL-CSR

*Tuesday, 3 September 2019 17:20 (20 minutes)*

The Cooling Storage Ring of the Heavy Ion Research Facility in Lanzhou (HIRFL-CSR) is constructed to study nuclear physics and relative applications. The experiments at the HIRFL-CSR drive the development of new detectors. Aiming to reduce the developing time and cost of each detector system, a Versatile Readout Platform (VRP) has been designed as a tentative common readout platform for the detectors at HIRFL-CSR. By adopting the Smartfusion2 FPGA SOC as the main FPGA, the VRP is expected to withstand the radiation environment in the HIRFL-CSR. This paper will discuss the design, implementation and first performance results of the VRP.

### Summary

The Cooling Storage Ring of the Heavy Ion Research Facility in Lanzhou (HIRFL-CSR) is constructed to study nuclear physics, atomic physics, interdisciplinary science and relative applications. The various experiments at the HIRFL-CSR drive the development of different detector systems. The front-end electronics of each detector is specific, but the readout electronics is possible to be commonly shared. Aiming to reduce the developing time and cost of each detector system, the Versatile Readout Platform (VRP) has been designed to serve as a tentative common readout platform for the detectors at the HIRFL-CSR.

The VRP board is a radiation hard, 6U PXI standard, general-purpose platform. By adopting the Smartfusion2 FPGA SOC as the main FPGA, the VRP is expected to withstand the strong radiation in the HIRFL-CSR. The VRP hosts two high-speed fiber optical links, the PXI interface, the Ethernet Interface, the LVDS interface for digital input and the high-speed ADC for analog input. The drivers of each interface have been pre-defined in the firmware, so the user logic can be easily included to realize specific functions.

As of writing, the VRP is being commissioned in the gamma detector in the HIRFL-CSR. This paper will discuss the design, implementation and first performance results of the VRP.

**Primary author:** Prof. ZHAO, Chengxin (Institute of Modern Physics, CAS)

**Presenter:** Prof. ZHAO, Chengxin (Institute of Modern Physics, CAS)

**Session Classification:** Posters

**Track Classification:** Systems, Planning, Installation, Commissioning and Running Experience