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Integrated control system for space radiation environment test based on 100 MeV proton accelerator

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This project aims to develop a 100 MeV proton accelerator-based space environment chamber and create a radiation test database of electronic and optical components in the space environment. The chamber for the space radiation environment consists of various beam diagnostic equipment and control points. An integrated control system for remotely monitoring and controlling these signals has been implemented. The control system collects beam and sensor signals using ZYNQ and ADC chips, reads vacuum degree, temperature, cooling parameters, and controls gate valves and pumps. The interlock system for machine protection stops the beam trigger of the timing system and closes the beam shutter in an emergency. EPICS and modules were used for ADC data processing and communication with peripheral equipment in a single Zynq-based system, and the control system was connected with control network of the 100 MeV proton accelerator. This paper discusses the design and construction of an integrated control system for the space environment chamber.

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Footnotes

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