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The fast RF interlock system for CAFe II linac

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The CAFe II is upgraded from Chinese ADS Front-end demo facility, it's a superconducting radio frequency(SCRF) linac to accelerate the proton or heavy ion for nuclear physics research. The facility aims to synthetic superheavy elements which demand high beam availability, therefore, the new fast RF interlock system has been developed to meet the reliability requirements for long-term operation of superconducting cavities, the system is required to immediately turn off the RF drive of cavity when fault event occurs. The fast RF interlock system was designed to detect fault conditions by monitoring cavity and coupler vacuum, coupler temperature, and arc events in coupler. All interlock signal connections were designed as optical fiber connections in the new RF interlock system, and the protection logic was implemented in the FPGA which has an embedded processor to support remote monitor and control. The new fast RF interlock system has been successfully tested and is running on line, the response delay was tested to be less than 5 us.

Keyword

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