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Development of a beam gate control system for proton beam irradiation at KOMAC LINAC

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A total of ten beamlines have been designed for the KOMAC 100-MeV proton linear accelerator (LINAC), among which five are currently operational and delivering beams to users. The LINAC system comprises an ion source, radio frequency (RF) system, high voltage converter modulator (HVCM), and a beam diagnostic system, all synchronized through a timing system to enable precise beam acceleration. A dedicated monitoring and control environment has been established for experiments conducted in each target room. Prior to beam irradiation, beam uniformity and dose per pulse are measured, and users input the desired total fluence into the control panel to initiate beam service. The beam gate control system is designed to automatically stop the beam trigger once the user-defined fluence is achieved, ensuring accurate and safe beam delivery. The beam gate control system was implemented with a redundant architecture to safely control the trigger signals output from the timing system. This paper presents the design and implementation of the beam gate control system developed for beam irradiation applications at KOMAC.

Footnotes

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