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Remote irradiation controls at the UMCG PARTREC cyclotron

The recent Covid pandemic has shown the importance of providing accelerator users with tools to control their experiments remotely. Giving them direct access to the control system would however constitute a major security risk, on top of the system itself being often complex to use.

At the PARTREC accelerator, work is ongoing to provide secure access via an interface PC connected to the public Eduroam network. This interface can interact with the control system PC only by exchanging data over a serial cable, thus minimising the attack surface. The interface PC provides a simple GUI for sending and receiving commands to the control system PC, alongside a live video feed of the irradiation room and the operators'room via RTSP. Customers can connect to it via VPN. The possibility is also given of using the customer's own laptop as interface, manually exchanging commands as strings over serial.

Controls available to users will include:

 Beam on/off Dose/fluence specification Energy at sample via degrader Field size: Collimator and/or Scan magnet settings Positioning: control of XY-table, rotation stage Flux/Dose rate (Beam intensity)

 For each setting, setter and getter commands are defined to control and receive feedback from equipment. A simple server written in Python is set up on the control system PC, handling the serial communication and interfacing with the control system. The implementation provided can control the irradiation by calling a set of LabVIEW routines, which constitute the bulk of the pre-existing irradiation control system. The server is designed for flexibility, and LabVIEW can be exchanged with any control system of choice.

Work-package

WP2 - RIs for Nuclear Physics

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