



We are developing a portable demonstrator platform for pre-clinical proton irradiation research. The SIRMIO platform aims at developing the beam shaping, imaging, treatment and diagnostics methods needed for image-guided irradiation of small animal tumor models. The platform can be installed at the experimental beamline of clinical proton irradiation facilities. Its beamline degrades and strongly focusses the clinical proton beam, such that precise treatment of few cubic millimeter sized tumors is possible. By moving and rotating the irradiated object with remotely controllable stages, spot scanning treatment delivery is realized.

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Detector R&D

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Precise irradiation relies on an accurate and continuous monitoring of beam position, size and intensity, without disturbing the beam quality. This information, registered with an ultra-thin beam monitor ionization chamber (IC), is then used to enable the clinical beam for each of around 100 irradiation spots and disable it, after the desired dose per spot has been reached. Between each irradiation spot, the position of the irradiated object and the configuration of the beam shaping elements need to be adjusted. The proton computed tomography and the positron emission tomography imaging systems on the platform need to be triggered by the same logic.

We are looking for a

Master Student

for realizing, assembling and characterizing the ultra-thin three-gap SIRMIO beam monitor IC, for implementing the beam-switching logic and signals based on the IC readout system and for calibrating and thoroughly investigating the response of the detector to pre-clinical and clinical proton beams.

You will be able to perform hands-on detector work in our modern cleanroom and laboratory facilities, will get familiar with detector readout systems and their application, will learn how to program a FPGA based module for beam on/off signal generation and will analyze, understand and discuss the performance of your system in the small and highly motivated team for gas detector R&D at the chair of Medical Physics.

Your development is based on experience with a prototype IC, which is available right from the start for test measurements. Throughout 2022, the different SIRMIO sub-systems will be tested in increasingly complex setups at clinical facilities in Europe. You will be able to participate in these measurement campaigns and collect data for your own monitor and beam switching system.

Enjoyment of experimental work and great motivation are major prerequisites. Prior knowledge in medical, particle or detector physics is helpful, but not mandatory. The thesis will include programming and analysis tasks.

If we caught your attention, we would be happy to receive your application including your transcript of records and CV to the email address below. You are always welcome to visit us in Garching for a lab tour and a chat in person.

Contacts

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Short video on the prototype beam monitor IC: <https://cloud.physik.lmu.de/index.php/s/KtdrS9PgEZ6q7Nq>

Information on the SIRMIO project: www.lmu.de/sirmio

Information on the chair of Medical Physics: www.med.physik.uni-muenchen.de