Letter of Support for the proposal of a Helmholtz Investigator Group at IBPT

As head of the Institute for Beam Physics and Technology, I support the application of Dr. Miriam Katharina Brosi for a Helmholtz Investigator Group with the title: “Beam Dynamics and Collective Effects in the Generation and Propagation of Structured Beams for Advanced Accelerator-based Radiotherapy.”

The promising proposal intends to make a very timely contribution to the current research topic of novel radiotherapy methods based on temporally and spatially structured accelerator-generated beams. By investigating the influence of collective effects on the dynamics for these complex beam properties and, furthermore, extending the consideration of collective effects into the beam-matter interaction outside of the accelerator, the project aims for an improved predictability of the beam properties. This, combined with a systematic study of applicable diagnostic methods, will provide the basis for the planned exploration of possibilities and physical limitations towards accelerator-based pulse shaping and modulation, striving for the generation of predefined beam shapes on the target.

This research into the dynamics, detection and control of short-pulsed accelerator beams with custom properties fits very well into the research activities within the context of the Helmholtz program Matter and Technology (MT) with the topic Accelerator Research and Development (ARD) conducted at IBPT. The strong ties to the partner topic Detector Technologies and Systemes (DTS) with the strong in-house partner at KIT, the Institute for Data Processing and Electronics (IPE), will be a valuable asset for the project. Furthermore, the project aligns very well with the new KIT-center Health Technologies, strengthening the important component of accelerator research with respect to radiotherapy.

Given her great scientific achievements and her experience in student supervision, Miriam Brosi is a very-well suited candidate for a group leader position. Her in-depth knowledge of beam dynamics in accelerators with extreme operation modes combined with her outstanding expertise in the field of collective effects and fast beam diagnostic methods provide a promising foundation for the proposed research project.

In my function as head of institute, I confirm that IBPT will provide the required 25% of the total funding to co-finance the group in case of the approval of the proposed Helmholtz Investigator Group for the whole duration of the funding.
Furthermore, IBPT confirms that, for the full duration of the funding period, the provision of office space and infrastructure (including furnishings and IT services) is guaranteed as well as access to all necessary resources and research infrastructures will be granted. This covers dedicated time for experiments at the accelerator facilities of IBPT including the diagnostic and experimental setups in connection with the accelerators. A non-exhaustive list includes the test-facility FLUTE, the spatial light modulator setup, accelerator based beam diagnostics and the Water-equivalent slab phantom for dosimetric measurements.
For the duration of the funded Helmholtz Investigator Group project, IBPT will not exert any influence on the independent work on the specified research project.
Finally, it is confirmed that the funding by the institute is sustainable and following a positive evaluation at the end of the funding period, a permanent position will be available to Miriam Brosi at the institute.