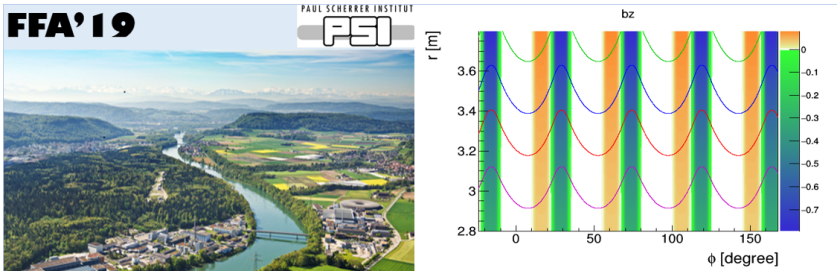

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Beam optics design and optimization for a superconducting gantry

The novel superconducting (SC) gantry has become a research hotspot with the tendency of compact proton therapy system. The footprint and weight of the gantry can be significant reduced by using SC magnets, and alternating gradient field of local achromatic bending sectors provides large momentum acceptance which means the magnetic field of SC magnets can remain fixed during tumor treatment. We presented a first order beam optics design of a SC gantry. Considering a large momentum deviation of proton beams, second order aberration and fringe field effect have been studied for optics optimization.

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