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Improving Beam Simulations as well as Machine and Target Protection in the SINQ Beam Line at PSI-HIPA

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With a nominal beam power of nearly 1.4 MW, the PSI High Intensity Proton Accelerator (HIPA) is currently at the forefront of the high intensity frontier of particle accelerators. Key issues of this facility are minimization of beam losses as well as safe operation of the SINQ spallation source. Particular attention is being recently paid towards an improved understanding of the properties of the SINQ beam line by both enhancing the beam transport simulations and developing new diagnostic elements which can also, in some cases, preserve the target integrity by preventing too large beam current density, inaccurate beam steering or improper beam delivery. Moreover, part of the SINQ beam diagnostic concept is being rethought in order to include important missing devices like BPMs. On the simulation side, newly developed particle transport programs like MCNP and BDSIM will deliver insights about beam losses and transmission through collimators. All recent and planned developments of the SINQ beam line will be discussed in this contribution.

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