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Status of SIS100 slow extraction design including effects of measured magnetic field errors

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The synchrotron SIS100 at FAIR, currently under construction in Darmstadt, Germany, will deliver slow extracted proton and ion beams up to 100 Tm employing resonant extraction. Its compact super-ferric dipole and quadrupole magnets allow fast ramping of magnetic field up to 4 T/s and 57 (T/m)/s, respectively. Recently, field errors has been measured for the dipole magnets and the first batch of quadrupole magnets. Higher order multipoles may interfere with resonant extraction, changing the geometry of the separatrix and conditions for resonant particles. The latter are affected most during their last turns and in the extraction channel owing to their large amplitudes, which amplify the effect of higher order multipoles. SIS100 comprises a set of corrector magnets up to octupole order, which can be used to compensate the impact of magnetic field errors. In this contribution, we report on the status of the slow extraction simulation studies including field errors. Furthermore, we present alternative working points for slow extraction, which are necessary to avoid the transition energy for some of beams required by the FAIR experiments.

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Footnotes

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