

SIS100 Working Point Study: Magnet Errors and Space Charge

Adrian Oeftiger

To assess SixTrackLib frozen SC model, evaluate tune footprint¹:

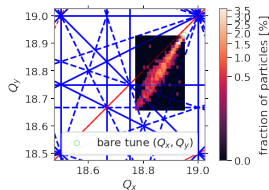
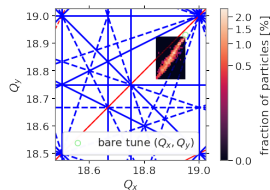
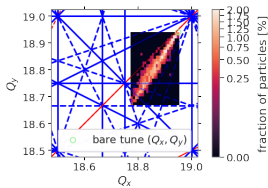


Figure: no transv. cuts, no rescaling, RMS equivalent SC

Figure: “ 2σ ” cuts, with rescaling, Gaussian SC field from rescaled distribution (non-RMS-equivalent!)

Figure: “ 2σ ” cuts, with rescaling, RMS equivalent SC

- “ 2σ cuts”: cut at $2\times$ nominal RMS amplitude in phase space
- rescaling: enlarge distribution to eventually obtain an RMS = nominal RMS
- RMS equivalent SC: choose space charge node RMS parameters for the Gaussian field to be equal to tracked initial distribution RMS values

¹ NAFF frequency analysis over 128 turns, max shift equivalent to instantaneous approach (cf. Vera's SC workshop presentation [↗](#))

Tune Scan with frozen SC

For scenario B) (2nd plot on slide before), ran tune scan without magnet errors:

