

Optimization of sextupole magnetic fields at the SPring-8 storage ring

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In a low emittance ring, an optimization of the sextupole magnetic fields is indispensable for the sufficient beam injection and the long beam lifetime. At the SPring-8 storage ring, the beam dynamic issues caused by sextupole fields, such as the nonlinear resonances and the amplitude dependent tune shifts, were examined by using the analysis based on the Hamiltonian and the tracking code CETRA [1]. The sextupole coefficients optimized for the beam injection were adopted to the machine, and the improvement of the injection efficiency was experimentally confirmed. The beam dynamic phenomena observed with the turn-by-turn monitors well represented the tracking results. These results will be presented in detail.

[1] J. Schimizu, et al., Proc. of 13th Symp. on Accel. Sci. and Tech.
Osaka, Japan (2001), pp.80-82.