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Increasing single-bunch intensity limit at ESRF-EBS with high coupling

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Synchrotron radiation light sources normally operate at a low coupling between the transverse planes in order to achieve flat beams and produce high peak brilliance. Instead, operating at a high coupling has other advantages such as smaller emittance degradation due to intra-beam scattering, improved Touschek lifetime, and lower sensitivity to vibrations of the photon beam. Moreover, it has been suggested that a high coupling may enable achieving higher bunch currents thanks to sharing of the beam-induced wakefields between the transverse planes. We were able to take advantage of this effect to substantially increase the TMCI threshold at zero chromaticity and nearly double the single bunch current limit at high chromaticity at ESRF-EBS.

Footnotes

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