

Analytical Estimation of Field Modulation at the Injection Area of the 3GeV RCS in J-PARC

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Ceramic chambers are utilized at the 3GeV rapid cycling synchrotron in J-PARC. The chambers are surrounded by copper stripes, shielding the beam-associated electromagnetic fields from radiating to the outside of the chambers. Capacitors are attached on either side of the respective stripes. When the capacitors activate, they block the eddy currents. However, the capacitors on the chambers in the injection bump magnet were broken in 2007. Accordingly, the intolerably large field modulations caused the significant beam losses at a special tune. Last year, the replacement of all capacitors by new ones has remarkably suppressed the field modulations. The mechanism of the suppression is theoretically analyzed in this report.

References

[1] Y. Shobuda, Y. Irie and S. Igarashi, Phys. Rev. ST **12**, 032401 (2009).