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Experimental measurement of quadrupole beam oscillating frequency at CSNS RCS

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In high intensity proton synchrotrons, space charge effects will cause tune shift of the beam. When the betatron tune spreads over a resonance line, the betatron oscillation amplitude will get larger, causing large beam loss. Through the quadrupolar beam transfer function, the coherent space-charge tune shift of quadrupolar beam oscillations can be derived with quadrupole oscillating frequency.

China Spallation Neutron Source (CSNS) is a high intensity accelerator based facility consists of linear accelerator and the Rapid Cycle Synchrotron (RCS). A quadrupolar BPM is already installed at RCS for obtaining quadrupolar beam oscillating information this year. This paper will present the experimental data during accelerator commissioning and how to obtain the quadrupole beam oscillating frequency on CSNS/RCS.

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Footnotes

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Yes

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