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Mitigating collective effects in the rapid cycling synchrotron through the use of a static field damping wiggler

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The Electron Ion Collider (EIC) Rapid Cycling Synchrotron (RCS) requires highly polarized, high intensity beam at 3 GeV injection that can be ramped to 18 GeV. The need to maintain beam stability at injection for the high intensity bunch requires increased damping that is not provided without the use of a Static Field Damping Wiggler (SFDW). This paper describes bunch stability challenges at injection with high intensity and the mitigation technique of the these collective effects through the use of a SFDW. This paper also provides a path to ramping to 18 GeV with the SFDW.

Footnotes

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