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EIC impedance and beam dynamics

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A new high-luminosity Electron-Ion Collider (EIC) is being developed at BNL. Beam collisions occur at IP-6, involving two rings: the Electron Storage Ring (ESR) and the Hadron Storage Ring (HSR). The vacuum system of both rings is newly developed and impedance optimization is progressing. Beam-induced heating and thermal analysis are performed for both rings to manage and control thermal distribution. The study explores collective effects across the Rapid Cycling Synchrotron (RCS), ESR, and HSR using simulated single bunch wakefields. Discussions encompass impedance analysis, collective effects and beam interactions, and the impact of ion and electron clouds on beam dynamics.

Footnotes

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