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Closing crab dispersion by dispersive RF cavity in Electron-Ion Collider Hadron Storage Ring

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The Electron-Ion Collider (EIC) uses the local crab crossing scheme to compensate the geometric luminosity loss of the 25 mrad crossing angle in the interaction point. Due to space limitations and other optics constraints, the beam optics at the crab cavities in the Hadron Storage Ring (HSR) is not perfectly matched to fully compensate the crab dispersion. This paper discusses the possibility of closing the crab dispersion by a dispersive RF cavity. The formula is derived and the required momentum dispersion at the RF cavity is calculated. The weak-strong simulation is performed to demonstrate this idea

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Footnotes

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Yes

Primary authors: XU, Derong (Brookhaven National Laboratory); LUO, Yun (Brookhaven National Laboratory)

Co-authors: AVRONSART, Julien (Brookhaven National Laboratory); BERG, J. (Brookhaven National Laboratory); BLASKIEWICZ, Michael (Brookhaven National Laboratory); LOVELACE III, Henry (Brookhaven National Laboratory); MONTAG, Christoph (Brookhaven National Laboratory); TEPIKIAN, Steven (Brookhaven National Laboratory); WILLEKE, Ferdinand (Brookhaven National Laboratory); WITTE, Holger (Brookhaven National Laboratory); GAMAGE, Bamunuvita (Thomas Jefferson National Accelerator Facility); MOROZOV, Vasiliy (Oak Ridge National Laboratory)

Presenter: LUO, Yun (Brookhaven National Laboratory)

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