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Correction of horizontal partial snake resonances with pulsed skew quadrupoles at the Brookhaven AGS

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Proton polarization is preserved in the AGS by using helical dipoles partial snakes to avoid depolarizing vertical resonances. These same helical dipoles also drive numerous (82) weak horizontal resonances that result in polarization loss. These horizontal resonances occur at the same energy (and therefore frequency) as depolarizing resonances driven by linear betatron coupling. A new scheme has therefore been implemented to correct the snake-driven resonances with the placement of skew quadrupoles in the AGS ring powered to cancel the resonance driving term at each horizontal resonance crossing. The skew quadrupoles are required to pulse independently for each resonance to account for the variation of drive term phasing with energy. Fifteen thin skew quadrupoles have been installed in the AGS ring to implement this correction. We describe the correction principle, the magnet design and commissioning results from RHIC Run 24.

Footnotes

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Primary author: SCHOEFER, Vincent (Brookhaven National Laboratory)

Co-authors: LEHN, Daniel (Brookhaven National Laboratory); MAHLER, George (Brookhaven National Laboratory); HUANG, Haixin (Brookhaven National Laboratory); MARNERIS, Ioannis (Brookhaven National Laboratory); SANDBERG, Jon (Brookhaven National Laboratory); AVRONSART, Julien (Brookhaven National Laboratory); TSOUPAS, Nikolaos (Brookhaven National Laboratory (BNL)); LYNCH, Richard (Brookhaven National Laboratory); BADEA, Sorin (Brookhaven National Laboratory)

Presenter: SCHOEFER, Vincent (Brookhaven National Laboratory)

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