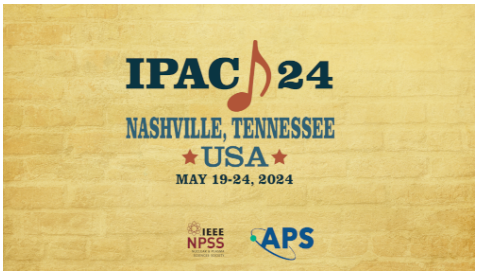

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Modeling interference of two first-order resonances with two Siberian snakes using machine learning

Monday, 20 May 2024 16:00 (2 hours)

The model of spin depolarization invoking isolated resonances hinges on a closed-form solution of energy ramping with the Single Resonance Model by Froissart and Stora. However, for non-resonant orbital tunes, resonant depolarization by single resonance crossing is impossible in the SRM while using a pair of Siberian Snakes since the amplitude-dependent spin tune is then fixed to one-half. Polarization loss in RHIC demonstrates that the isolated resonances model is not a good approximation of polarization dynamics with two Siberian Snakes. We therefore extend the model in which a pair of resonances in close proximity push the amplitude-dependent spin tune away from one-half in the presence of Siberian Snakes, allowing the crossing of higher-order spin resonances associated with depolarization. We present results from applying Machine Learning methods that establish spin transport models with two overlapping resonances from tracking data.

Footnotes

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