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Start to end commissioning simulations for SOLEIL II storage ring

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This paper presents comprehensive start-to-end commissioning simulations for the SOLEIL II storage ring upgrade, demonstrating the feasibility of achieving an ultra-low emittance of 84 pm-rad at 2.75 GeV. We detail a multi-step correction strategy addressing challenges posed by the dense magnet arrangement and limited number of BPMs and correctors. Our simulations encompass first turn trajectory correction, beam-based alignment (BBA), and Linear Optics from Closed Orbit (LOCO) techniques. Results demonstrate the robustness of the correction scheme in the presence of realistic errors, showing successful recovery of design emittance, suitable dynamic aperture, and expected beam lifetime. This work provides insights into an efficient commissioning strategy for SOLEIL II, supporting rapid commissioning and full performance restoration for user operations.

Footnotes

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