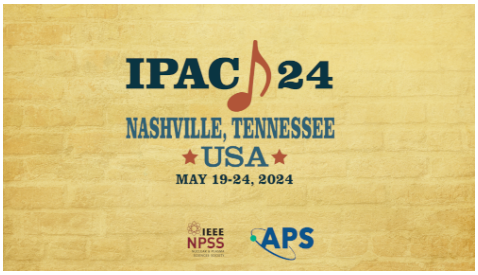

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Detailed characterization of coherent synchrotron radiation effects using generative phase space reconstruction

Sunday, 19 May 2024 16:00 (2 hours)

Coherent synchrotron radiation (CSR) effects in linear accelerators, such as projected emittance growth and microbunching, have been well studied. However, traditional measurement techniques lack the precision to fully comprehend the intricate multi-dimensional aspects of CSR, particularly the varying rotation of transverse phase space slices along the longitudinal coordinate of the bunch. This study explores the effectiveness of our generative-model-based high-dimensional phase space reconstruction method in characterizing CSR effects at the Argonne Wakefield Accelerator Facility. Additionally, we assess the current limitations in resolution of the phase space reconstruction method and conduct an analysis of its accuracy and precision through simulated scenarios. Finally, the reconstruction algorithm is tested using synthetic beams that emulate distributions affected by CSR.

Footnotes

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