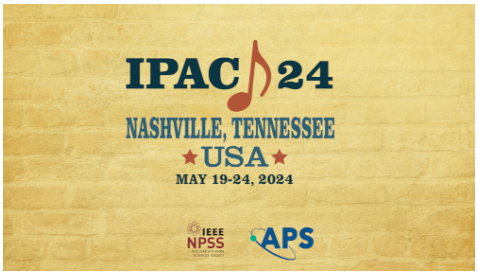

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Nonlinear optimization of generalized longitudinal strong focusing steady-state microbunching storage ring

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Steady-state microbunching (SSMB) storage rings are promising candidates for coherent-EUV-radiation light sources. In a generalized longitudinal strong focusing (GLSF) approach, the concept is to achieve perfect cancellation of modulations by ensuring that a particle's coordinate remains identical after passing through both modulators. This requires effective control over the deviation in the longitudinal position, contributed from the lattice nonlinearity. Additionally, since GLSF involves both vertical and longitudinal dimensions, it is crucial to limit the growth of the apparent vertical emittance as well, which is induced by the distortion of the lattice nonlinearity. This paper derives the expressions for these indicators in terms of beam parameters and lattice map elements. It aims to provide valuable insights into the system's behavior and improve the performance of the GLSF unit.

Footnotes

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