### IPAC'24 - 15th International Particle Accelerator Conference



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# Unifying coherent synchrotron radiation wakefield and classical radiation reaction

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

We develop an alternative theory of coherent synchrotron radiation (CSR) wakefield using the transverse field solution of Maxwell equations in angular domain. This approach allows us to retain only the radiative interaction between particles and cure the frequently encountered divergence in retarded potentials. We analyze the classical radiation reaction force and mass renormalization induced by the CSR self-field. Futhermore, we illustrate our theory by explicitly calculating the steady-state CSR wakefield of a wiggler.

#### Footnotes

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## **Region represented**

Asia

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