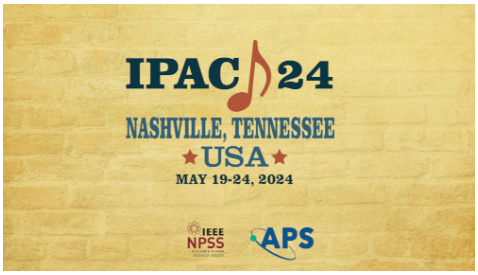

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Temporal profile optimization for beamline design using an improved multi-objective genetic algorithm

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

Our research focuses on the design of a beamline. Due to the numerous beamline components involved, without strict optimization of each component's parameters, the transmitted temporal profile of beam may distort, failing to meet the expected requirements. Additionally, different initial temporal profile of the beam will undergo longitudinal shaping during transmission through the beamline. Therefore, we aim to determine the combination of initial beam temporal profile at the cathode and the parameters of the beamline components based on the specific beam distribution at the exit. We propose the application of an improved multi-objective genetic algorithm to solve this problem. Through multiple optimization iterations for a given temporal profile, our algorithm consistently identifies multiple suitable combinations of initial beam temporal profile and beamline component parameters to produce the desired specific temporal profile of the beam.

Footnotes

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