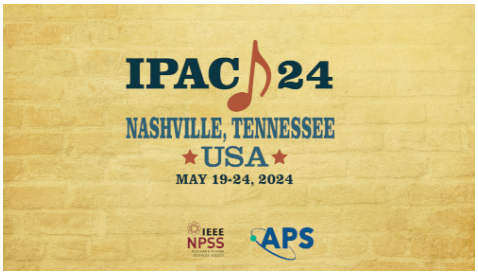

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Machine learning for the LCLS-II injector online modeling and optimization

Thursday, 23 May 2024 16:00 (2 hours)

The LCLS-II is a high repetition rate upgrade to the Linac Coherent Light Source (LCLS). The emittance and dark current are both critical parameters to optimize for ideal system performance. Here we summarize the role these tools played in the commissioning period and are playing in the current operational stage of the LCLS-II injector, which provides an example of how other accelerator facilities may benefit from combining online modeling and optimization infrastructure. We also describe current progress on creating a fully deployed digital twin of the LCLS-II injector based on a combination of ML modeling and physics modeling, using the LUME software suite and various ML-based characterization tools. Finally, we will describe current efforts and plans to leverage the online LCLS-II injector model in fast optimization and control schemes.

Footnotes

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