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Preparing the next phase of the steady-state microbunching proof-of-principle experiment at the Metrology Light Source

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Steady-state microbunching (SSMB) is a proposed scheme to generate coherent radiation at short wavelengths from a microbunched electron beam in a storage ring. The feasibility of the idea is investigated in an ongoing proof-of-principle (PoP) experiment conducted at the Metrology Light Source (MLS). Phase I of the SSMB PoP experiment has been using an experimental setup employing a single-shot modulation laser to show the general viability of the idea, and has explored the underlying complex storage ring dynamics. The next step in the SSMB PoP campaign is to progress from the single-shot setup of phase I towards quasi-steady state. To this end, a new laser system is installed at the MLS that can provide turn-by-turn modulation of the electron beam for 1000 revolutions. The main goal of this phase II of the SSMB PoP experiment will be to show bound motion of electrons within individual laser-induced microbunches. In this paper, we show the progress of preparation for PoP phase II, with emphasis on the setup and integration of the new laser system and diagnostics challenges.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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