

Steady-State Microbunching experiment at the Metrology Light Source – Recent Progress

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Coherent radiation is a powerful scheme for storage ring-based synchrotron radiation sources as its intensity increases with the square of the number of radiating electrons. Formation of bunches or sub-bunches shorter than the radiation wavelength is necessary for the radiation from different electrons to add in phase and therefore cohere. Recently at the MLS it was shown that in a dedicated isochronous optics an electron beam energy modulation induced by an externally applied laser in an undulator section leads to the formation of sub-bunches with a length of 1 μm one turn later^[1].

Here we report on recent progress and continuing development of this experiment.

[1] Deng, X., Chao, A., Feikes, J. *et al.* Experimental demonstration of the mechanism of steady-state microbunching. *Nature* **590**, 576–579 (2021). <https://doi.org/10.1038/s41586-021-03203-0>