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Evolution of Microbunching in Drift Sections

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The typical layout adopted in a seeded harmonic generation free-electron laser is based on radiator undulators placed immediately after the dispersive section, where the bunching is created.

With the advent of new and more complex seeding schemes, this solution cannot always be implemented and cases, where the bunched beam needs to be propagated in free space before entering the radiator, should be investigated.

The evolution of the density modulation in a drift may also play a role on long intra-undulator sections in short wavelength FELs.

We report here on recent studies aimed at investigating the impact of bunching evolution in a drift space on coherent harmonic emission. Experimental results collected at the FERMI free-electron laser are compared with theoretical and numerical predictions.

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