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SP7: The impact of microbunching on the synchrotron radiation spectrum at bERLinPro

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bERLinPro is a high average current energy recovery LINAC prototype. Although the space charge driven microbunching instability (MBI) is not expected to occur during the nominal operation of bERLinPro, there are possibilities to drive the microbunching. These include the use of a FODO-Lattice in the straight section and/or shortening of the bunch length. Thus, taking advantage of these possibilities bERLinPro enables dedicated investigation on MBI and future MBI-based radiation sources. In this connection the investigation of the impact of microbunching on the spectrum of emitted synchrotron radiation at bERLinPro is of great interest. The presented work studies this effect using numerical simulations. ASTRA is used to track bunches through most of the recirculation structure. Thereafter WAVE is used to track the bunches through a dipole field map and calculate the synchrotron radiation spectrum. In addition to the nominal bunch and current lattice of bERLinPro a new lattice including the proposed FODO structure and a shorter bunch are also considered.

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