Contribution ID: **25** Type: **Poster**

Studies of the Micro-Bunching Instability in the Presence of a Damping Wiggler

Wednesday 26 September 2018 16:30 (1h 30m)

At the KIT storage ring KARA (KArlsruhe Research Accelerator), the momentum compaction factor can be reduced leading to natural bunch lengths in the ps range. Due to the high degree of longitudinal compression, the micro-bunching instability arises.

During this longitudinal instability, the bunches emit bursts of intense coherent synchrotron radiation in the THz frequency range caused by the complex longitudinal dynamics. The temporal pattern of the emitted bursts depends on given machine parameters, like momentum compaction factor, acceleration voltage, and damping time.

In this contribution, the influence of the damping time is studied by utilizing the CLIC damping wiggler prototype installed in KARA as well as by simulations using the Flasov-Fokker-Planck solver Inovesa.

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Session Classification: Poster Session

Track Classification: BEAM DYNAMICS