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Longitudinal beam dynamics simulations for the CERN accelerators

Wednesday, 2 October 2024 14:20 (30 minutes)

The beam longitudinal dynamics code BLoND is a framework developed in the RF group at CERN since 2014. It has emerged as a central tool for performing particle tracking simulations in the longitudinal plane in synchrotrons. This talk covers several applications for existing accelerator facilities (e.g., Proton Synchrotron Booster, Large Hadron Collider, etc.) and future projects. The main code features including, among others, beam generation, collective effects, and interactions with RF control loops, as well as recent optimizations that enabled complex simulations will be presented. Further development plans will also be briefly discussed.

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