



Contribution ID: 88

Type: Talk

Challenging the Resolution Limits of Longitudinal Beam Profile Measurements

Linear accelerators for light sources, and for next generation particle physics machines, are now regularly pushing for ever shorter bunch durations, and for well defined non-Gaussian temporal profiles on sub-picosecond bunches. These requirements place significant challenges on the longitudinal diagnostics. To be effective at these time scales, the jitter of the beam profile and arrival time makes it necessary for single shot measurements of the full profile. There are several approaches to these diagnostic challenges, such as the direct temporal measurements of deflecting cavities; Electro-optic interactions between electron beam and lasers; and the so called "Optical Replica" scheme. Established techniques of spectral characterisation of CTR, CDR, or Smith Purcell radiation remain attractive, particularly for empirical feedback or tune-up diagnostics. An overview of capabilities of differing techniques will be given, together with a more detailed discussion of Electro-Optic schemes and the potential for pushing EO diagnostics to time resolutions to rival deflecting cavities.

Primary author: JAMISON, steven (STFC)

Presenter: JAMISON, steven (STFC)