Project plan: Timing Modes for Advanced Light Sources

TP A: Micro-Bunching Control | TP B: TRIBs Basics | TP C: TRIBs Injection | TP D: Timing + DLSRs | TP E: EEHG for DLSR, BESSY II

2019 Q3 | 2019 Q4 | 2020 Q1 | 2020 Q2 | 2020 Q3 | 2020 Q4 | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2

Micro-Bunching Contro

TP A

aaa

bbb

ccc

Thesis and publications of results

TRIBs Basics: Setting-in period

TP B

Theory of TRIBs population; Establishing TRIBs at DELTA; Basic experiments on TRIBs

Experiments including bunch-by-bunch feedback (BBFB), Optimising TRIBs mode: separation, dynamic aperture, lifetime

Experiments including laser-induced energy modulation; Optimising TRIBs mode: separation, dynamic aperture, lifetime

Thesis and publications of results

TRIBs Injection: Setting-in period

TP C

Study injection into BESSY II: Physical and technical limits; Setting up diagnostics

Optimize TRIBs injection with classical 4-kicker injection scheme: Reduce duration of orbit distortion, technical & physical limits, BBFB-X, fast quadrupol kick, ...

Study new injection scheme, injecting directly into TRIBs orbit: Theoretical understanding with simulations, 4-kicker, 3-kicker, non-linear kicker injection, applicability on DLSR lattices

Thesis and publications of results

Timing+DLSRs: Setting-in period

TP D

Bunch length limits by single particle dynamics in DLSRs: Generic lattice of a DLSRs, Low alpha lattice in MBA

Multi-Bend-Achromat (MBA) lattice and VSR, parameter space: Achievable shortening and lengthening, selected beam dynamics topics

MBA lattice and TRIBs: MBA lattice in non-linear regime, close to resonance, non-linear beam dynamics, DA optimization, orbit separation, injection

Thesis and publications of results

EEHG+DLSRs: Setting-in period

TP E

EEHG at BESSY II, Achievable parameter

Generic lattice of a DLSR
EEHG simulation studies in MBA
Proposal of EEHG in a future DLSR setup

Proposal of EEHG in a conceptual design for BESSY III
Investigation on future steady-state micro-bunching schemes

Thesis and publications of results

Kick-off meeting at HZB, Common Experiments at BESSY II

First results on TRIBs dynamics, MBA lattice design, micro-bunching control Common Experiments at DELTA

Evaluation of achieved methods, concepts and results - Applicability in user operation? Common Experiments at KARA

Closing meeting: Results, Conclusions, Lessons Learned, Outlook