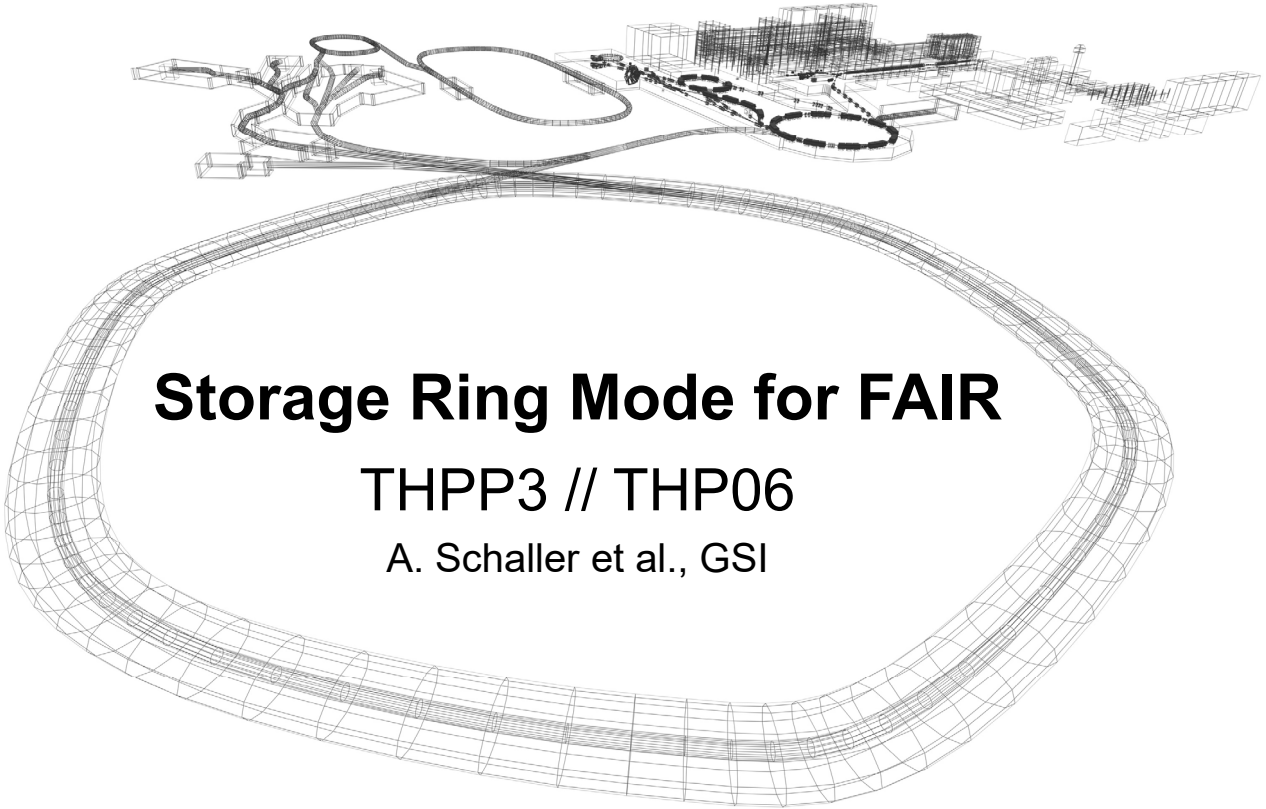


Storage Ring Mode for FAIR

THPP3 // THP06

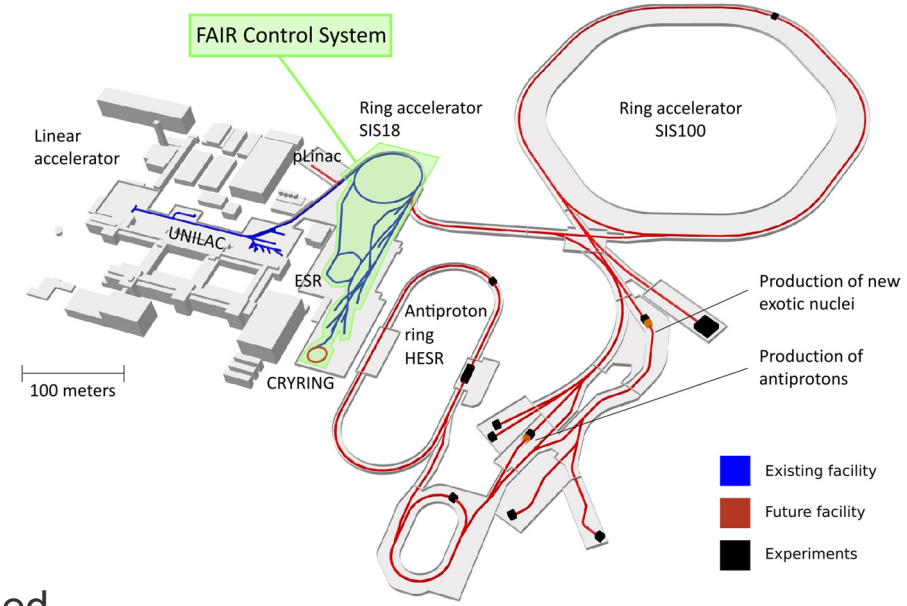
A. Schaller et al., GSI

New Control System for FAIR

- The new Control System for FAIR is already being used at the existing GSI facility and continuously enhanced

- Since 2015: Synchrotron support
  - Pre-planned schedules
  - Deterministic behavior

- New in 2019: **Storage Ring Mode**
  - Basic blocks of the schedule are pre-planned
  - Interactively controlled execution of the blocks at runtime



Coupling:
Synchronizing Injector and Storage Ring

Strong Coupling

- Beam is produced and extracted on request
- Storage ring waits for the injector to produce the beam
- Guarantees beam transfer
- Possibly long idle times for the storage ring

Weak Coupling (“fire and forget”)

- Injector *always* produces and extracts beam
- Storage ring can serve other experiments while the beam is produced
- Beam may be lost
- Manual synchronization needed

Storage Ring Mode Features

- **Breakpoints**: Pause and continue on user interaction

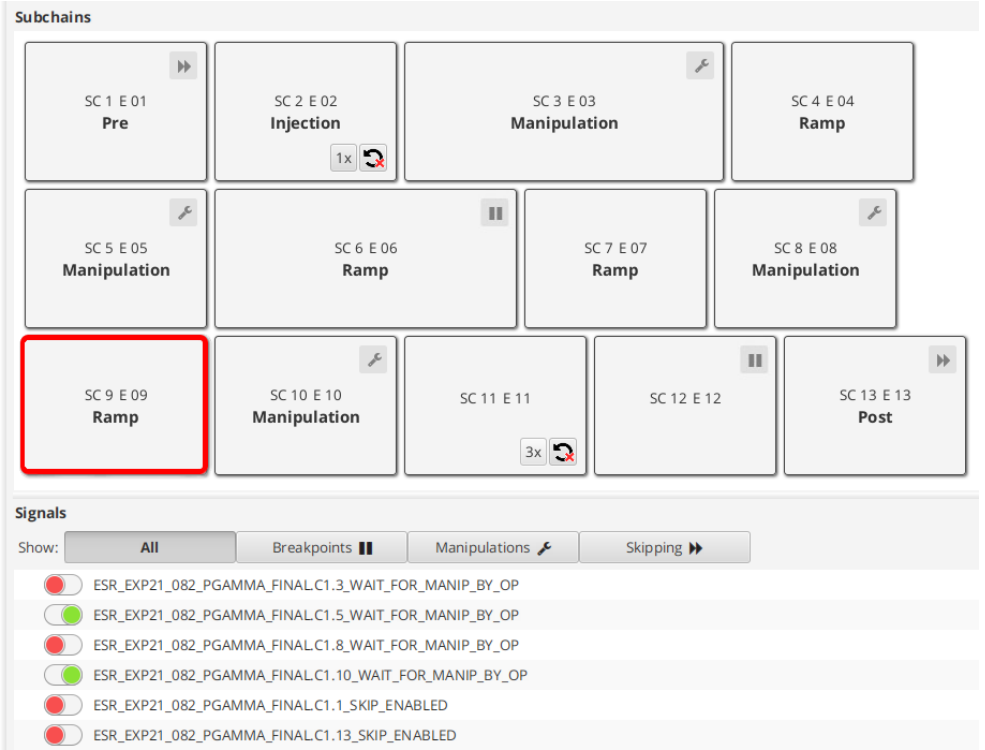
- **Skipping**: Optionally skip parts of the schedule

- **Repetition**: Repeat parts of the schedule *N* times, can be aborted

- **Manipulation**: Pause execution and modify device settings

Application „StoRiMo“

- Visualizes current point of execution in the schedule
- Shows which features are available for a block
- Interactive control of the features by the operators



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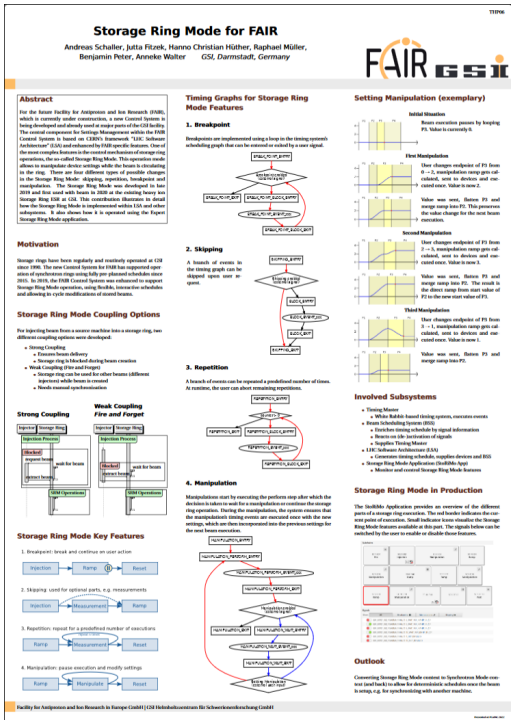
- Andreas Schaller, GSI
- Benjamin Peter, GSI



Storage Ring Mode for FAIR

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Abstract

Motivation

Storage Ring Mode Coupling Options

Strong Coupling

Weak Coupling
Fire and Forget

Storage Ring Mode Key Features

Timing Graphs for Storage Ring Mode Features

1. Breakpoint

2. Skipping

3. Repetition

4. Manipulation

Setting Manipulation (exemplary)

Involved Subsystems

Storage Ring Mode in Production

Outlook