



Tesla Collaboration Meeting
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Diagnostics for TTF II

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What's the Job of the Diagnostics Coordinator?

- The Electron Beam Diagnostics for TTF II are designed and produced by different Groups of the Collaboration.
- The Diagnostic Coordinator has to know the Spec, the basic Principles, the Status and the Time Schedule of each Diagnostic Project. He has to report about the Status to the TTF II Management.
- He has to be the Interface between the Diagnostics and the „Rest“ of the Machine.
- He has to check, if all Aspects of the Diagnostics are covered, and to initiate new Projects if required

Requirements for TTF II

- Beam Position: ^a 20 μm (LINAC Striplines); ^a 10 μm (Undulator Pickups)
- Bunch Profile: OTR ^a 10 μm (Beam Sizes between 50 – 500 μm)
Wirescanner < 5 μm
- Bunchlength: down to 80 – 100 fs, different Compression Stages
(Spectroscopic Methods in the FIR,
Streak Camera @ low compression)
- Charge: 0.1 – 10 nC
Resolution: 10^{-2} (Single Pulse); 10^{-3} (Pulse Train)
- Losses: < 10^{-4} (whole LINAC)
< 10^{-3} (Collimator)
< 10^{-8} (Undulator, long Time Average)
- Energy: < 10^{-3} e- Spectrometer (Dipole + BPM)
< 10^{-4} SASE Spectrum
- Dark Current: < 1 μA @ 1.3 GHz
- Phase Jitter: < 1 ps



Non Physical Requirements

One main Goal of TTF II:

- First User Facility build with TESLA Technology
- First Synchrotron Radiation Facility of the 4th Generation

Therefore: Reliability, Robustness, High Uptime become an Issue

Consequence for Diagnostics:

- Try to define and to use as few as possible Standard Systems
- All Systems have to withstand long Machine Runs
- They must be stable, robust, well documented
- Maintenance by the Operation Crew
- All Spares available at the Site



Standard Instrumentation Components

- Striplines: 34 mm, 44 mm Types fixed in the Quads
- BPM Electronics: Modular System suitable for Striplines and Pickups
- Toroid System: 34 mm Type, Exception Bypass and Dump
- OTR: OTR Standard Chamber (about 20), few special chambers
Ongoing work to define a standard optical system
- Wirescanner: Integration to a modified OTR-WS System under Discussion



e-Beam-Diagnostics for TTF II

Coordination: D. Nölle, MPY



