Working Group 4 Progress Report

Talks have been high quality and focused on ERLs.

Reviewed performance of a wide range of diagnostic and timing devices and methods.

Much progress in timing systems and synchronization

- Optical/RF synchronization at 50 fs level
- Optical distribution of low-level clock signal with 0.1 – 1 ps jitter
- Optical master oscillator with 20 fs synchronization (kHz – MHz)
- All optical clock with intrinsic noise < 1 fs (μHz – kHz)

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Many non-invasive, high resolution methods discussed

- Electro-optic crystals with 100 fs resolution
- Cavity BPMs with 1 μm resolution
- Beam loss monitors with nA resolution
- Diffraction radiation
- Synchrotron radiation
- BPMs, feedback, digital systems
- Subtle phase and amplitude modulation of RF
- Diagnostic undulators
- Synchrotron light interferometer
- Photon BPMs
- THz radiation

Mildly invasive methods

- Flying carbon wire
- Pulse picking with RF deflector

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Todd Smith visited WG 1 during our injector discussion.