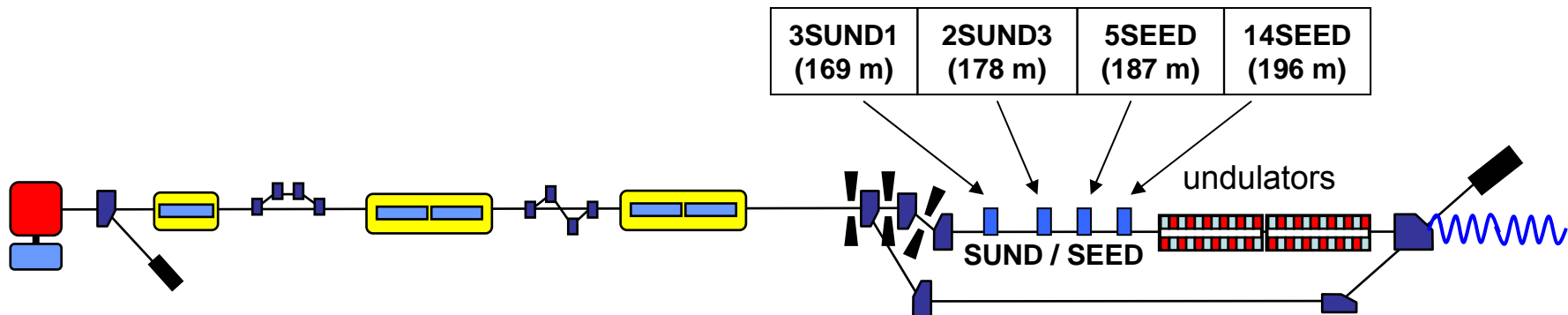


Katja Honkavaara (UNI-HH and DESY)

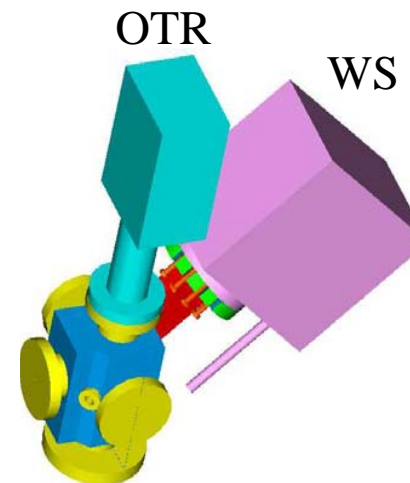
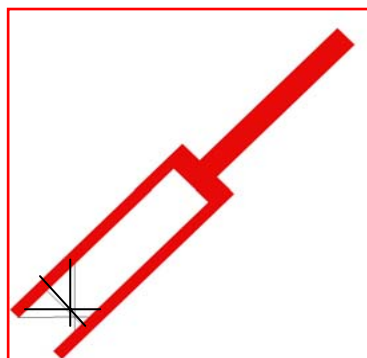
4 OTR stations in SUND / SEED section will be replaced
by 4 OTR+WS stations



- Measurements of **beam sizes and profiles, emittance and Twiss parameters** in SUND / SEED section + **matching** before undulator
- Measurements done so far with OTR monitors. Good results achieved, but also some problems / disadvantages:
 - **OTR monitors cannot be used for on-line measurements (destructive)**
 - **Losses in undulator when OTR screens inserted.**
 - Solved by mounting 2 steerers (D14SEED) to dump the beam (max 2 bunches) to the wall of the beam pipe during OTR measurements
 - **Alignment of OTR screens/optical set-ups critical**
- Wire scanners provide on-line, non-disturbing measurements, can be used even during SASE delivery
- Complementary measurements using OTR monitors and wire scanners
- Old wire scanners from other accelerators (PETRA) available and can be modified to use at FLASH



- Identical to other OTR+WS monitors at FLASH:
 - 4/6/8/10DBC2, 5DBC3, 5ECOL, 7MATCH
- Standard OTR mover + screens and optical set-up
- 3 tungsten wires of 18 μm diameter mounted into a fork moving at 45 deg with respect to the beam
 - One wire horizontally, one vertically, and one at 45 deg allowing horizontal and vertical measurements with one device



- Vacuum components:
 - 4 new OTR+WS chambers constructed according to the old drawings (identical to old ones)
 - OTR out-put windows (fused silica) and small glass windows for illumination light will be reused in the new OTR+WS chambers
 - Two OTR chambers will be reused by Optical replica
- Wire scanners:
 - 4 new wire scanners + spares constructed from 6 old wire scanners; some new hardware components (e.g. fork, wires, ball-bearings,..) required as well
 - Scintillators, photo-multipliers, cabling and electronics needed
- OTR monitors
 - Movers, screens and optical set-ups reused
- Supports
 - See: Problems

- In the OTR chamber OTR out-put window is symmetrically in the middle, in OTR+WS chamber it is moved 15 mm upstream to have space for WS
 - Support of optical set-up + set-up itself must be moved 15 mm upstream. Enough space at 3SUND1, 2SUND3 and 14SEED, 5SEED critical
- Support for OTR chamber and OTR WS chamber different
 - OTR: simple support; pump below the chamber
 - OTR+WS: a stainless steel frame and a adjustable plate
 - Only realized few days ago → may come critical: it should be possible to construct frame in time, but not the adjustable plate



- Coordination: K.Honkavaara
 - MVP: H.Remde
 - MDI: N.Baboi
- Vacuum components, dis/remounting chambers from/to the linac: MVP
- Wire-scanner hardware and electronics: MDI
 - Mechanical construction + mounting WS to the chambers: H.Tiessen (B.Michalek, M.Siemens, S.Vilcins)
 - Electronics, cabling: G.Priebe
- OTR monitors
 - Dismount of optical set-ups: B.Polzin (MIN)
 - OTR movers and screens: R.Sorchetti (INFN-LNF)
 - Remount and alignment of optical set-ups: INFN-LNF/TorVergata + B.Polzin (MIN) and R.Zahn (MDI)
- Integration to control system: MCS4
 - WS server: O.Hensler
 - Motors: J.Thomas
 - BIS: M.Staack
 - User interface

Time schedule (status 06.03.2007)

Task	Start	Finish	Where
Hardware components (WS, chambers) ready		16.03.2007	
Dismount optical set-ups	26.03.2007	26.03.2007	Tunnel
Dismount OTR vacuum chambers	27.03.2007	30.03.2007	Tunnel
Hardware components cleaned and tested		05.04.2007	
Windows from old to new chambers	10.04.2007	13.04.2007	MVP cleanroom
WS to chambers + tests	10.04.2007	20.04.2007	MVP cleanroom
OTR screens + movers to chambers	16.04.2007	20.04.2007	MVP cleanroom
OTR+WS chambers ready for mounting		20.04.2007	
Mount of OTR+WS chambers to tunnel	23.04.2007	16.05.2007	Tunnel
Vacuum work finished (ECOL, SUND, SEED)		16.05.2007	
Survey ECOL, SUND, SEED section	21.05.2007	25.05.2007	Tunnel
Mount and align OTR optical set-ups + tests	04.06.2007	10.06.2007	Tunnel
OTR set-up ready		11.06.2007	
Cabling + electronics for WS and PM	26.03.2007	16.05.2007	Tunnel / Hall3
Mounting Scintillators + PM	21.05.2007	22.06.2007	Tunnel
Operational tests	21.05.2007	22.06.2007	Tunnel
OTR + WS monitors in operation		02.07.2007	

- Work need to be well coordinated with other work in ECOL, SUND and SEED sections: **Optical replica and replacement of D7ECOL chamber**
- Dates for work involving colleagues from INFN (mounting of OTR movers and alignment of OTR optical set-ups) are fixed, other dates are somewhat flexible (within given constrains)
- In order to align OTR optical set-ups, a reference line is required
 - **We plan to use alignment laser port of D7ECOL to shoot light downwards → vacuum between D7ECOL and 14SEED must be closed, section surveyed and valves open when aligning optical set-ups**
- Goal: OTR+WS monitors fully operational when FLASH operation starts after the shutdown.
- Operation of 'old' WS along the linac will also be checked