Draft proposal for a task within RF work-package of EuCARD-II

Wake-field Monitor Development

Partners: CERN, PSI + others ?

Linear colliders and X-ray Free Electron Lasers require good control of wake-fields.
Long range wakes suppressed by HOM damping and detuning (CLIC).
Short range wakes driven by beam to structure alignment.
Alignment can be determined by coupling to the wakes.
→ Wake Field Monitor.

1. CERN developing prototype X-band structures for wake-field experiments on FACET
2. PSI/ST/CERN developing X-band structure for longitudinal beam dynamics for SwissFEL and Trieste FEL.
3. Wake-field monitor under design at CEA.

WP tasks

1. Design and fabricate multi-purpose RF Front Ends for WFM.
   Should be easily adaptable to different frequencies; 15 GHz, 18 GHz, 24 GHz
   Build hard-ware for CTF3 and SwissFEL injector.

2. Design and fabricate alternative WFM(s) for other structures
   (collaboration with CERN).

3. Test and commission the different RFFE and pick-ups with beam at CTF3 and SwissFEL injector.

Resources:
Hardware: 6 RFFE ~ 120 kE; WFM ~ 80 kE.
Manpower (PSI): Scientist/engineer 6 months, post-doc 2 years, technician ~ 2 years.
+ CERN manpower (?)

Participating laboratories: CERN, PSI
Infra-structures involved: CTF3, SwissFEL Injector