

Summary of meetings at SLAC

October 2012: Helmholtz VI, FACET user's meeting, SAREC review

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- > Allen Caldwell: heat pipe oven (to be built first) is not thought to reach uniformity below 1% → need to develop metal vapor oven in parallel for AWAKE experiment
- > PITZ talk: remarks by Vitaly Yakimenko
 - Energy signature of modulated electron beam could be smeared by coherent synchrotron radiation (10 to 100 keV)
 - Doubling of emittance by polymer window seen at Brookhaven experiments (not the case in Dieter's simulations)
- > New members to be invited to Helmholtz VI: UCLA (Jamie Rosenzweig) and SPARC (Massimo Ferrario)
- > Yearly meetings planned. Next: Sep/Oct 2013 at DESY



FACET User's Meeting

- Diverse program including PWA, bunch length measurements, high field physics, etc.
- Vitaly Yakimenko will be the new head of FACET division at SLAC starting Oct. 15th
- 10 TW laser is planned to be installed at FACET in 2013 pending funding decision (has high priority). Target: February
- X-band transverse deflecting cavity was commissioned at FACET
- Collimator system for longitudinal bunch shaping (double pulse by cutting out middle and asymmetric pulse by cutting ends) was set up
- FACET runs until 2016 when LCLS II starts. FACET II could use first third of linac (beam energy: nominal 10 GeV, max. 13 GeV). Possible first beam in 2018 – minimal costs: \$35M
- Plasma cell planned to be set up in 2013: up to 1.5m length of plasma channel (1mm diameter), pre-ionized with Axicon optics



- > New Proposal presented by Jorge Vieira (IST, Lisbon): Self modulation of long lepton bunches in dense plasmas (similar to PIZ experiment)
 - Signatures: Energy gain/loss, focusing/defocusing. Problem: transverse deflecting cavity etc. to measure longitudinal phase space is installed BEFORE plasma cell experiment
 - Could start next year when laser ionization is established
 - Ranked: Very Good
- > X-band RF undulator was developed by Sami Tantawi (UCLA)
- > Norbert Holtkamp (interim head of SLAC):
 - Mission of SLAC: Grow into premier photon laboratory
 - Funding of FACET II is in direct competition with ASTA at FermiLab
 - DESY has 1 GeV electron beam and soon 200TW laser: need same for FACET III!
 - Cooperation with DESY? E.g. DESY member on SAREC panel (Ralph)



Input for Plasma Cell

- Aberrations in beam optics of ionizing laser (distortions in glass reduce focusability) tend to enlarge beam (how much?), e.g. redistribute power from central peak to rings of Bessel beam. Could also cause secondary hot spots behind focus line of axicon
- MgF_2 has very low nonlinearity (good for lenses etc.)
- Visualizing screen for Ti:Sa laser: Luminescence e.g. in glass, Ce: YAG etc.
- Possible issue: fogging of mirrors etc. in plasma cell by metal vapor
- Gas density measurement
 - at UCLA: Interferometry
 - at FACET: No measurement – calculation via temperature / pressure
- Plasma cell heater
 - Heater band „Omegalux“ – www.omega.com
 - Heat insulating shell made from mica



Plasma Cell at FACET

