

# Discussion, Action Items, & Future Work Plan

Jim Clarke  
ASTeC & Cockcroft Institute  
Daresbury Laboratory

ILC Positron Source Collaboration Meeting  
29 – 31 October 2008  
The Cockcroft Institute, Daresbury Laboratory

- Review the R & D
- Review the action items from the last meeting
- Understand the Minimum Machine proposals
- Plan Positron Source work for 2009
  
- Be trained in EDMS and agree how we will use it

- Review action list
- Try to cover ongoing R&D and needs of Minimum Machine studies (note colour coding)
  - Set priorities for short term (ILC 08)
  - Medium Term (KEK April 09)
  - Longer Term (end 2009)
  - General comments/outstanding items
- Discuss future meetings of team
  - Webex only?
  - Workshop like this one?
  - At GDE events?
- Discuss Positron Source Team Area setup in EDMS

- Generate beam test plan – Jim
- Horizontal magnet measurements required at some stage
- Electron beam tests required at some stage
- Modules need to be engineered for large scale production and operation
- Intermodule connections need engineering
- “Real” Undulator spectrums required for modelling of source – Duncan (next meeting)
- Write a Report on vertical test results – Nick/Duncan/RAL (next meeting)
- Store cryomodule safely so can be powered at a later date
- Alignment requirements justified/jitter studies/impact on polarisation – Duncan
- Complete 4m cryomodule & test (fix leak!) – Jim
- Jim R’s presentation in Chicago to Akira (straightness & training) – Jim
- Cross-check und parameters selected for minimum machine (probably easier) - RAL

- Write-up undulator emittance effect – Wei (next meeting)
- How thick does concrete/other material need to be - Andriy
- Move undulator to 250GeV, reoptimise source parameters (und, target, OMD) - Wei
- Ongoing yield/polarisation evaluation with source design evolution (Wei)
- Operating scenario (hours in tunnel when off) – Nick/Marc suggest 200 hours per year, 10mSv allowed dose per year
- Write list of current simulation codes and objectives + input files – Ian
- Running at 50GeV for calibration (what is energy spread etc) – Wei
- Look at PTRAN losses in ANL simulations - Wei

- Continue DR stacking studies and work with DR group to ensure optimum solution - Frank
- cavity stability tests (LAL/KEK) - Omori
- Laser demonstration – Fabian Zomer, Vitaly
- ATF demo – Omori
- 2010/11 demo with new cavity of high gamma flux at ATF

- Write brief report justifying need for 5Hz positron spin flipping at some point and ability to reverse – Sabine (next meeting)
- Confirm investigation showing we can destroy polarisation in DR completely – Larissa
- Close contact with IP group polarimeter (Tony)
- Ensure spin survives to DR
- Electron spin also within undulator – Des
- Close contact with simulations group – spin track to IP
- Select spin rotator design (5GeV/400MeV?) – check concern of Alexander - Sabine

- High power photon collimator needs to be studied
  - ➔ Study activation – Lei (next meeting)
- Positron collimation – design documented, needs updating as source evolves
- Variable aperture collimator needed for polarisation upgrade?



- Complete Eddy current tests at Daresbury – Ian/Leo
- Store target properly – Ian/Jim
- Generate simulations to compare with experimental results – Jeff / RAL/Leo
- Pressure shock wave analysis – Stephan (next meeting) and numerical modelling later
- Energy compression before DR to be studied – Nick?/Wan Ming
- Lifetime studies of target (LLNL)
- Engineered solution, including prototype tests – water, vacuum, ...
- Alternative liquid metal & window (BINP/KEK tests) – Junji
- RIA Ferrofluidic seal study information – Jeff
- Joint target for auxiliary & und source (3 X0 and 0.4 X0)
- Report on hybrid target scheme for ILC - Omori

- Li Lens
  - Evaluate level of radiation damage in window & implications for lifetime
  - Stress-strain in window with liquid flow
  - Thermal cycling fatigue
  - Cavitation wear on windows
  - Proton beam tests?
  - Contact experienced Li lens experts to discuss this idea (Jerry Dugan?) – Marc to provide names
  - KEKB BN window tests (liquid lead target)
  - Discuss with M Harrison (solid/liquid?)
  - Concern with liquid Li containment in steel (Pavel)
  - Discuss with Harrison and create work package for 2009 – Jim/Nick/Marc/Jeff/Alexander/Wei
- Flux Concentrator
  - Need feasible design - Jeff

- Preliminary use of detailed target model in Fluka – Luis/Lei/Andriy (next meeting)
- Collimator in RH (next mtg)
- Shielding thickness around target etc – Andriy (next mtg) - duplicated
- RH scenarios refined
  - Changeover times (requirement ties in with lifetime of kit in RH)
  - Replacement of pillow seals?
- Auxiliary source (needs RH as well) – KEKB?/Kuriki
- Pillow seals need R&D
- Need engineered design compatible with source layout (remove inconsistencies!)
- If yield increases then RH not needed (limited only?)

- Understand timing issues for ILC, work with DR group to look at options – Jim/Andy W
- Minimum machine integration with BDS etc - Norbert

- Define structure - Jim
- Report back on EDMS status – ongoing action  
Ian/Lars

- Define new specification for Auxiliary positron source – Jim
- Establish link with KEKB high intensity conventional source project – Jim/Kamitani

- Discussion on future meetings of team ...
- PMs ask for positron source team to attend the main ILC/GDE meeting each year – general agreement on this from team
- Next main event probably Autumn 2009
- No decision on how we should meet at other times
  - Could have WebEx meeting 6 months out of phase with main ILC meeting (eg Spring 2009)
  - Could have Collaboration Meeting but concern raised over travel budgets