

Summary of Sources working group WG1

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with contributions from several participants

28 talks in 6 sessions

Session 1: General overview:

- J. Clarke: ILC e^- and e^+ sources overview
- L. Rinolfi: CLIC e^- and e^+ sources overview
- J. Clarke: ILC/CLIC e^+ generation working group
- S. Riemann: Which type of polarimetry, at which energies for LC ?
- M. Kuriki: Review of the risks for e^+ sources
- A. Latina: Review of spin rotators for LC

Session 2: Experimental results at KEK:

- T. Kamitani: Flux concentrator for SuperKEKB
- F. Zomer: French 4-mirrors cavity results
- T. Omori: Japanese cavity: results, status and future
- T. Omori: Liquid lead target tests
- T. Takahashi: Status of hybrid targets R&D

Session 3: Polarized electron sources:

- J. Sheppard: Review of polarized electron sources for LC
- M. Petrarca: Where we are with lasers performance for polarized e^- sources ?
- M. Poelker: CBAF experience with high voltage gun

Session 4: General reviews for positron sources

- O. Dadoun: A crystal photon radiator code as event generator for GEANT4
- C. Xu: Review of Optical Matching Device for e^+ beams
- F. Poirier: RF manipulations after the AMD for CLIC
- A. Vivoli: Review of e^+ transport from capture to Pre Damping Rings

Session 5: Polarized positron sources (I):

- V. Yakimenko: Overview for Compton linacs based e^+ sources for LC
- I. Bailey: Overview for Undulators based e^+ sources for LC
- T. Omori: Overview for ring/ERL based e^+ sources for LC

Session 6: Polarized positron sources (II):

- I. Chaikovska: CLIC ERL based e^+ source
- J. Urakawa: Where we are with lasers performance for polarized e^+ sources ?
- T. Piggott: Rotating targets and flux concentrator
- F. Zimmermann: Issues for e^+ stacking in the rings
- E. Bulyak: Compton ring and stacking ring for LC
- W. Gai: Polarization versus e^+ yield
- T. Takahashi: Update on conventional source study for LC

17 Institutes contributing to ILC and CLIC studies have presented simulations and experimental results

ANL, BINP, BNL, CERN, Cockcroft Institute,
DESY, Hiroshima University, IHEP, IPNL, JLAB,
KEK, LAL, LLNL, NSC-KIPT/Karkhov, RAL,
SLAC, Uludag University

Some highlights for ILC and CLIC polarized electron sources

- 1) Generation of CLIC charge has been demonstrated
- 2) Generation of ILC charge has not yet been demonstrated but should be feasible

Mainly today remains only JLAB (and SLAC) performing some experimental tests for ILC

Important R&D is mandatory to solve the different issues related to the source:
(High voltage DC gun, photocathode lifetime, laser stability,)

An operational test stand is highly recommended to test polarized e^- sources

Some highlights for unpolarized positron sources

1) The unpolarized e^+ source based on pseudo-conventional targets is the CLIC baseline

2) KEK Linac experiment with hybrid target (using channeling process) provides very encouraging results

3) For ILC , a 300 Hz scheme is proposed:

Simulations shown no show stopper and BN window experiment shown good behavior

4) Several target issues have to be finalized which could strongly impact the luminosity :

- Peak Energy Deposition Density for hybrid targets

- Shock waves

Common challenges between ILC and CLIC (see “ILC/CLIC e^+ generation” working group)

Some highlights for ILC and CLIC polarized positron sources

Undulator

- 1) Undulator powered for the first time at the design current in horizontal cryostat
- 2) Nb₃Sn technology is being developed at RAL => shorter period and high field
- 3) Rotating target experiment shown good behavior in air (Eddy current)
- 4) Experiment, in preparation at LLNL, for rotating seal in vacuum
- 5) Forthcoming experiment at LLNL on flux concentrator
- 6) Huge work done on simulations (present and future)

Compton

- 1) 4 mirrors experiments at ATF-KEK (French- Japan collaboration)
- 2) Stacking simulations results shown the enormous challenges for the stacking rings

“ILC/CLIC e⁺ generation” working group



J. Clarke

Conveners



L. Rinolfi

Most of the topics defined in 2008 have been completed today

A new updated program was presented at GDE meeting in March 2010 at Beijing
and it has been updated during this workshop

**An important meeting face to face, between several participants
in the WG1,**

**thanks to this workshop on Wednesday
at lunch time (between 12h and 14h)**

A “golden” value of 35 J/g for W target breakdown limit was used up to now.

New investigations are required.