WP3 : Polarimeter

Tuesday – Polarimeter design and past experience

15:30 → 18:40 WP3: 3150/R-002 — Join

15:30	**EIC Polarimetry Overview** **Speaker**: Ciprian Gal 220919_ComptonEl...	25m
15:55	**FCC-ee 3D Polarimetry** **Speakers**: Nickolai Muchnoi (Budker INP), Nikolai Muchnoi muchnoi.pdf	25m
16:20	**VEPP Polarimeters** **Speaker**: Stepan Zakharov (Novosibirsk State University (RU)) EPOL_report_Zakha...	25m
16:45	**Break**	15m
17:00	**HERA TPOL** **Speaker**: Stefan Schmitt (Deutsches Elektronen-Synchrotron (DE)) 220905_tpol.pdf	25m
17:25	**SLD Compton Polarimeter** **Speaker**: Mike Woods MWoods_FCC-EPOL... MWoods_FCC-EPOL...	25m
17:50	**JLab Compton Polarimeters** **Speaker**: Dave Gaskell JLab_compton.pdf JLab_compton.pptx	25m
18:15	**LEP polarimeter overview** **Speaker**: Jorg Wenninger (CERN) LEP-Polarimeter.Ep... LEP-Polarimeter.Ep...	25m

- 5 talks on past or operational polarimeters
  - VEPP, JLAB, SLD, LEP, HERA
- 2 talks on future system
  - EIC and FCC

Tuesday – Polarimeter design and past experience

- Summary
  - Different laser configuraton have been used : cavity or single pass laser interaction
  - Accuracy achieved in the order 0.5 to 1% depending on machine
  - Controlling laser polarisation accurately was a must in most cases (except LEP)
  - Measuring electrons and photons (strips, pixel detectors, GEMs, Cherenkov gas detector, calorimeter)
    - Background (SR, beam gas interaction, beam loss, beamstrahlung,..) has to be considered carefully but was not a real limitation in most cases

Wednesday – Laser system and Laser polarisation

15:30 → 18:30 **WP3: 3150/R-002** Join

15:30 **LUXE laser diagnostics** 25m
Speaker: Gianluca Sarri (Queen's University Belfast)
GSarri_FFC_Sept_2... GSarri_FFC_Sept_2...

15:55 **HERA LPOL2 laser system and polarization control** 25m
Speaker: fabian zomer
polar_cern.pdf polar_cern.pptx

16:20 **SuperKEKB, ILC and GammaFactory lasers systems** 25m
Speaker: Aurelien Martens (Université Paris-Saclay (FR))
EPOL2_Sept2022_... EPOL2_Sept2022_...

16:45 **Coffee break** 15m

17:00 **CERN STI/LP operational experience** 25m
Speakers: Bruce Marsh (CERN), Edu Granados (CERN)
FCC_polarization_w... FCC_polarization_w...

17:25 **JLAB and EIC laser design** 25m
Speaker: Ciprian Gal
220920_ComptonL...

17:50 **EIC integration challenges** 25m
Speaker: Zhengqiao Zhang (Brookhaven National Lab)
ComptonPolarimete...

- High power laser for LUXE
- CERN experience with laser operation
- 4 talks on laser system for polarimeter
  - SuperKEKb/ILC, JLAB, EIC, HERA, FCC

Wednesday – Laser system and Laser polarisation

- Summary
  - Modern laser technology have much improved performance in terms of stability
  - Would need a dedicated laser room close to interaction chamber → follow-up with integration
    - EIC will test high power optical fiber transmission
  - Laser systems for FCC looks feasible using available technology
    - Proposed scheme that would cover the two cases of measuring polarisation of pilot and colliding bunches (not at the same time)
  - Control of laser polarisation and measuring it precisely are essential
    - Typically 10-3 achieved (HERA). Achieving 10-5 accuracy on polarisation measurement is not impossible but required R&D and very careful design (QWP or photo-elastic modulator) and material choice.
  - Interaction chamber studied for SuperKEKb (2/4 degrees angle) apparently not an issue for impedance. Encouraging reesults !
    - EIC team will actually perform impedance studies soon.

Thursday – Detectors

15:30 → 18:30 **WP3: 3150/R-002** Join

15:30	**JLab Compton Detectors - Lessons Learned** **Speaker**: Dr Alexandre Camsonne	20m
15:50	**Detector R&D for ILC Compton Polarimeters** **Speaker**: Jenny List (Deutsches Elektronen-Synchrotron (DE)) JList_ILCPol_FCCee...	20m
16:10	**SuperKEKB photon detector: a proposal.** **Speaker**: Aurelien Martens (Université Paris-Saclay (FR))	10m
16:20	**LUXe electron and positron detectors** **Speaker**: Louis Helary (Deutsches Elektronen-Synchrotron (DE))	20m
16:40	**Break**	10m
16:50	**L4 emittance meter.** **Speakers**: Aurelie Noelle Goldblatt (CERN), Federico Roncarolo (CERN) FCC EPOL LINAC4 L... FCC EPOL LINAC4 L...	20m
17:10	**LHC luminosity monitors** **Speaker**: Stefano Mazzoni (CERN)	20m
17:30	**Timepix3 based detectors** **Speaker**: James Storey (CERN)	20m
17:50	**EIC Compton Detectors** **Speaker**: James Fast (PNNL)	20m

- 4 talks on Compton detectors
- 1 talk on LUXE
- 3 talks on detectors used at CERN with possibly similar functionalities

Thursday – Detectors

- Summary
  - Today's technology already fulfilling UHV requirements for e-dectector, sensitivty and resolution (time/spatial) for detection in general
  - Microstrips diamond/silicon – Diamond better for radiation hardness
    - Diamond pixel detector ?
  - Segmented (gas/quartz) Cherenkov detectors also offer interesting options
  - Fast Calorimetry using PbWO4 or BaF2 sicntillators
  - Radiation constrains would need ASIC for read-out. Can we find a common solution ? EIC and FCC have different timelines but.. Maybe exploit some synergy with othe project (upgrade of LHC experiment, HL-LHC, ..)
  - Direct radiation damage/ageing of the detector should be considered