



WP3 : Polarimeter

Monday – Polarimeter design and past experience

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

Tuesday – Laser system and Laser polarisation

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

