e₊@CLAS12 Meeting Notes

Participants : V. Burkert, L. Elouadrhiri, F.-X. Girod, S. Niccolai, E. Pasyuk, E. Voutier

Till proposal submission, a regular weekly meeting is scheduled on every Tuesday at 10:30 am JLab time.

List of tasks & assignments

i) Identification/review of issues with operating Hall B beam line with positrons (**Eugene**)
    As far the beam transport is concerned, magnet power supplies are bi-polar and then capable of transporting both beam polarities without any modification. Beam Position Monitors, Beam Current Monitors and the Faraday cup should be considered closely: the signal would change polarity which would imply adaptation or change of the electronics read-out. Some answer from Keith Cole: *J. Musson is putting together a write up on the topic and it should be available soon. After speaking with John, the short answer is the BCMs should fine, antenna BPMs would need to be flipped 180 degrees. The electronics should work for either setup.*

ii) Identification/review of issues with operating CLAS12 with positrons for comparison with electrons
    No progress.

iii) Identification/review of the different source of systematic errors in the comparison of electron and positron cross section
    No progress.

iv) Characterization of the electron/positron background environment (**Latifa**)
    In progress. The background distribution generated at the beam dump should change when operating positron beam and the impact needs to be evaluated. The configuration where the beam is sent to the tagger dump should also be assessed in terms of background. The background in the target area is also different from the associated electron beam background and its impact on CLAS12 operation needs to be evaluated.

v) Definition of an electron and positron calibration experiment (**Volker**)
    No progress.

vi) Modifications of the Møller polarimeter to operate in Bhabha scattering mode (**Brian/Eric**)
    Møller and Bhaba asymmetries are identical in magnitude and distribution. The magnets are currently operating symmetrically for the detection of an electron pair, which would change for an electron-positron pair and requires a different wiring of the magnets. One may also expect larger background if a coincidence between the electron and the positron cannot be achieved. Further simulation are needed.

vii) Generation of DVCS quasi-data considering approved DVCS measurements with CLAS12 and expected positron measurements with the same luminosity than electrons (**FX**)

No progress.

viii) Extraction of D-term from expected data and evaluation of the impact of unpolarized positron beams (**FX**)
No progress.

ix) Extraction of the CFF from expected data and evaluation of the impact of unpolarized and polarized positron beams (**Silvia**)
Previous projections of 12 GeV p-DVCS by Michel have been recovered. Projections are needed for positron cross sections to be combined with electron cross sections to provide beam charge asymmetries to be considered for the extraction of Compton form factors. FX and Silvia will decide about the format and content of BCA data.

x) Evaluation of the impact of the beam momentum spread and emittance on experimental observables (**Eric**)
From preliminary studies of Yves Roblin, the momentum dispersion of the electron and positron beam in the experimental hall is defined by the ARC acceptance so will be the same for electrons and positrons independently of the situation at the source. Beam emittance should be larger but (X,Y) corrector dipoles (currently unused) are existing in the beam line that could serve to provide similar beam spot at target.

xi) Proposal deadlines: 4/20 (abstract), 4/5 (proposal to CLAS Review Committee), 5/18 (CLAS Review Committee feedback), 5/25 (CLAS Review Committee recommendation), 6/1 (proposal submission) (**All**)
Eric will put in place an overleaf project for the proposal. In addition to the usual physics description, the proposal will comprise additions for the modifications of the Hall B line required for positrons, the modifications of the Møller polarimeter, and the positron source together with accelerator related issues.