Experimental Activities

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DESY

Achieved during the Last Year

1) Finalization of the H1 low Q^2 data (within H1 experiment)
- submitted two publications of HERA-I data for Q^2< 150 GeV^2
- experimental precision ~1.5%
- QCD fit with some assessment of parameterization uncertainty
- First publication of FL data
- Extension of FL result to low Q^2, preliminary release for DIS-09

Meeting: Analysis Center Groups, Management Board, DESY Directorate, May 4th 2009

2) HERA reduced cross section combination, QCD fit
(with H1 and ZEUS experimental groups, meetings at DESY ~1 per month)
- released herapdf 0.1, preliminary herapdf 0.2 (DIS 09 conference), goal to publish H1ZEUS1.0 set in summer 2009
- continue with combination of HERA-II data.
- extension beyond inclusive cross section.

3) PDF4LHC workshop and HERALHC workshop (experiment/theory joint effort to estimate PDF errors for LHC needs,
representing HERA exp., meetings: few per year).
- study of impact/evaluation of experimental uncertainties, studies of parameterization uncertainty.
- publication of HERALHC proceedings.

Identified Problems, Plans

- higher order QED radiative corrections are ~ with combined H1-ZEUS data precision.
Preliminary discussions with Bardin et al. Dubna group, expression of interest. About ~3 months of joint
experiment/theory work (early 2010 ? Before the ultimate H1-ZEUS

combination).

- open source QCD fitting package. So far limited to H1-based software which can not be used for CMS/ATLAS analyses.
A postdoc position to develop, support the open source fitting package.
Flexibility of the evolution/minimization/error propagation codes.
Requires knowledge in statistics, theory. Integration in CMS/ATLAS together with MC group (?)

- parameterization uncertainty is one of the leading error sources for PDFs. Theory motivated input shapes of PDFs
may help to reduce this uncertainty.

- Zoltan Nagy expressed interest to develop/support alternative to LHAPDF package, for more flexibility using multiple PDFs.

- Together with MC group, develope a MC reweighing tool to re-weight LO->NLO MC simulations. Preliminary discussion with Bardin et al. group. High impact on SM LHC analyses.