

## Group report: Collider physics and structure functions

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The activities of this group centered round two main topics of current interest. The advent of HERA the e-p collider at DESY led to the measurement of proton structure functions with unprecedented accuracy, in particular, at low values of the Bjorken variable  $x$ . Theoretical understanding of these results often demands departures from perturbative QCD. A part of the group activities was therefore devoted to structure functions and related topics. The following topics were discussed in working group sessions( the names of the contributors are given in parenthesis):

- 1) Determination of  $c^\gamma(x, Q^2)$  at HERA ( M.Drees and R.M.Godbole)
- 2) Polarised structure functions: possibility of constructing single spin asymmetries ( V.Gupta, D.Indumathi, H.S.Mani, P.Mathews, M.V.N.Murthy, R.Ramchandran, G.Rajasekaran, L.Sehgal, J.P. Singh and K.Sridhar)
- 3) Rise of  $F_2(x)$  at small  $x$ ,fixed poles and Schwinger terms ( K.Bora, V.Gupta, D.Indumathi, H.S.Mani, P.Mathews, M.V.N.Murthy, R.Ramchandran, G.Rajasekaran, V.Ravindran and K.Sridhar)

Searches for new particles and interactions indicating physics beyond the standard model are at the focus of attention of all the on going experiments at hadron and  $e^+ - e^-$  colliders like LEP 100 at CERN and the TEVATRON at Fermilab. The issues unresolved after the present round of experiments , if any, will continue to dominate the experiments at the future colliders like LEP 200 and LHC at CERN. In view of this a considerable part of the group activity was devoted to the phenomenology of new particle searches at hadron and  $e^+ - e^-$  colliders. The following topics were covered in some details( the names of the contributors are given in parenthesis):

**A) The search for Supersymmetry(SUSY)**

- 1) Virtual LSPs in  $N = 1$  SUGRA models (A.Datta, M.Drees and M.Guchait)
- 2) Like sign dileptons and SUSY searches in models with conserved and broken R-Parity (M.Guchait, N.K.Mondal and D.P.Roy)
- 3) Loop Induced gluino decays(M.Drees, M.Guchait, B.Mukhopadhyaya and D.P.Roy)
- 4) Limit on the lightest neutralino mass in R-parity violating theories (S.Banerjee, R.M.Godbole, K.Mazumdar, D.P.Roy and P.Roy)
- 5) Tau number violating signals for R-parity violating SUSY at LEP 200 (S.Banerjee, R.M.Godbole, K.Mazumdar and P.Roy)

**B) Higgs Physics**

- 1) Production of Charged Higgs in pp collisions via  $\gamma - \gamma$  interactions ( M.Drees, R.M.Godbole, M.Nowakowski and S.D.Rindani)
- 2) Implications of a tree level HWZ coupling at  $e^+ - e^-$  colliders ( R.M.Godbole, B.Mukhopadhyaya and M.Nowakowski)

**C) Gauge Boson Physics**

- 1) Failure of equivalent gauge boson (EVBA) approximation? ( G.Rajasekaran, S.D.Rindani and R.Sinha)
- 2) Single Z production in  $e^+ - e^-$  collision, anomalous triple gauge boson coupling and EVBA ( S.D.Rindani and J.P.Singh)
- 3) CP violating triple vector boson couplings at NLC ( P.Kalyaniak, P.Madsen, N.Sinha and R.Sinha)
- 4) Determination of triple gauge boson vertices at LEP 200 ( T.Aziz, S.Banerjee, K.Mazumdar, N.Sinha and R.Sinha )

Summaries of some of the above works were submitted by the authors. They are presented following this.