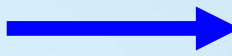
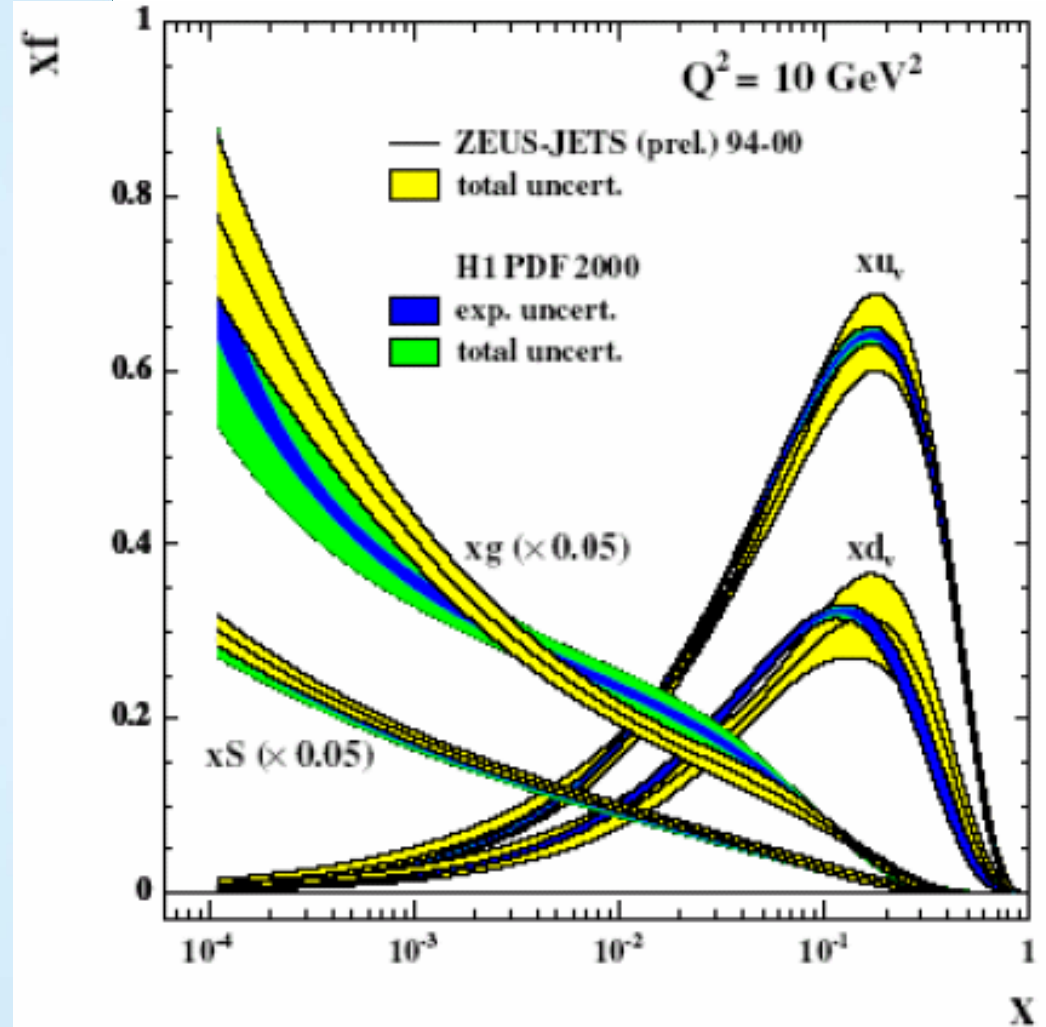
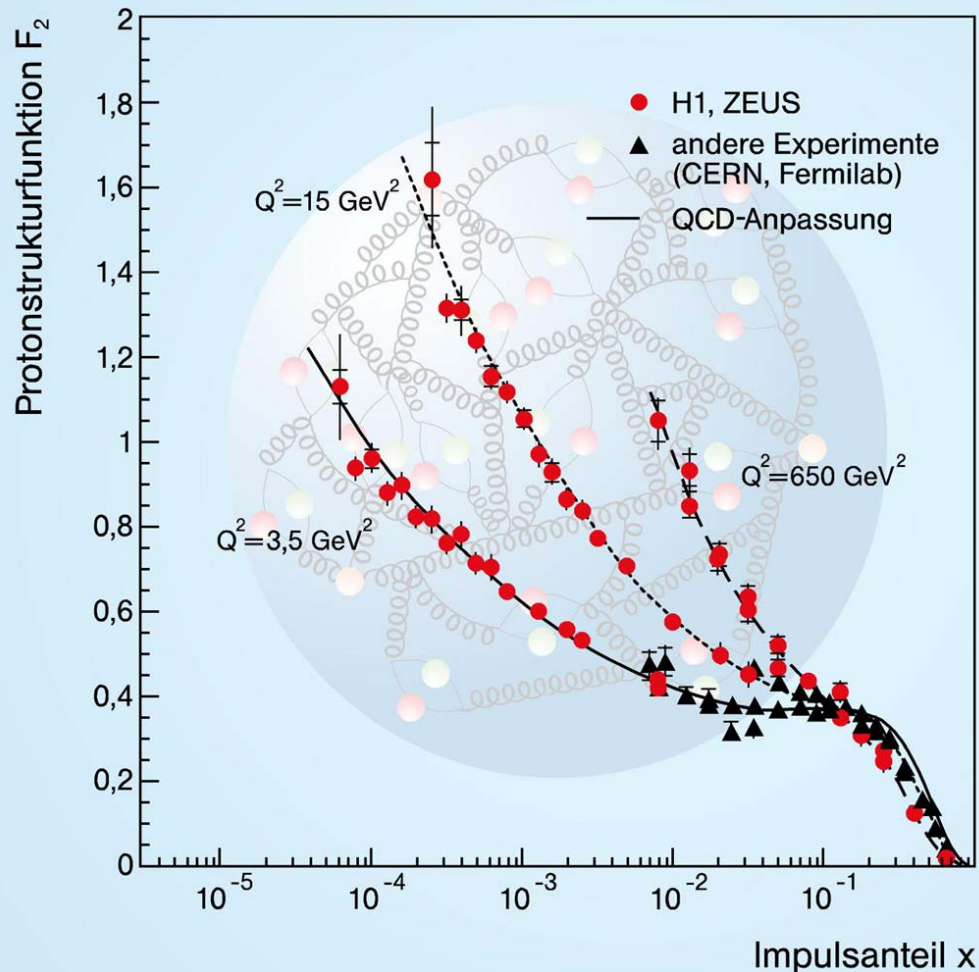


The Proton Structure

structure functions

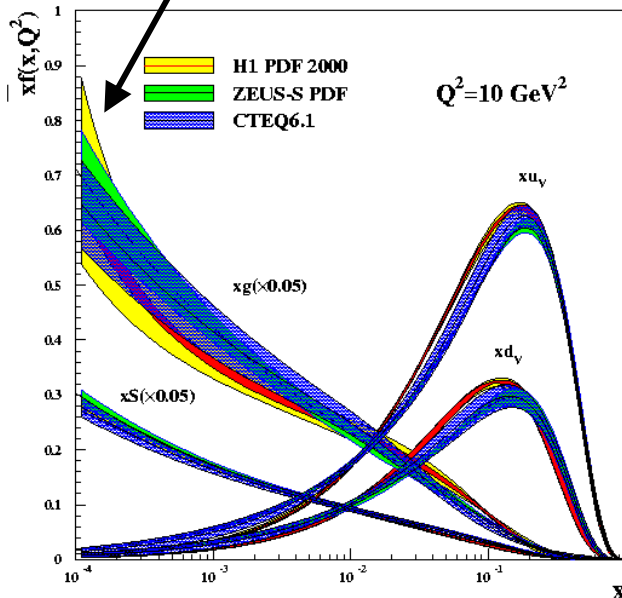


quark (and gluon) densities

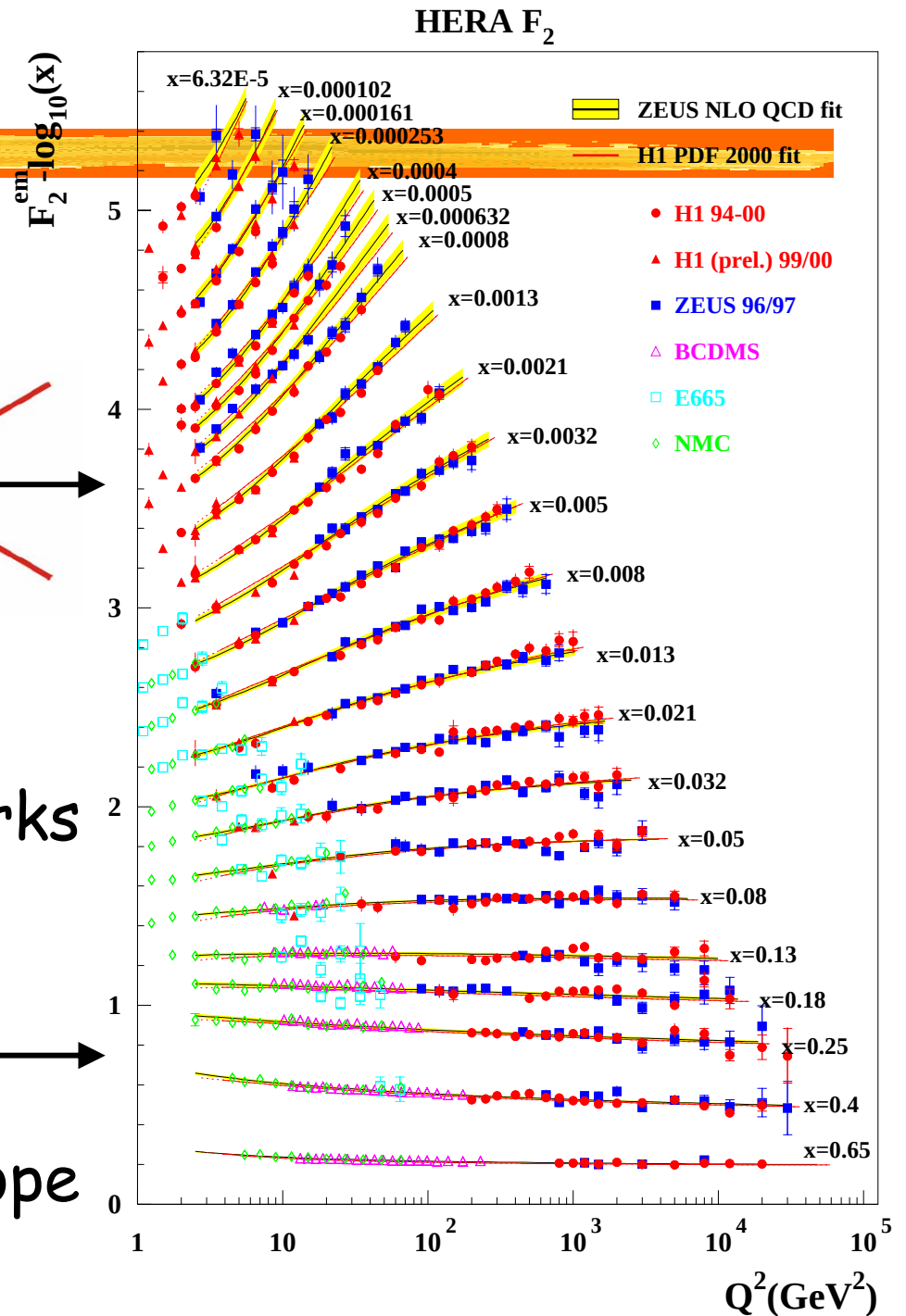


F₂ and gluon density

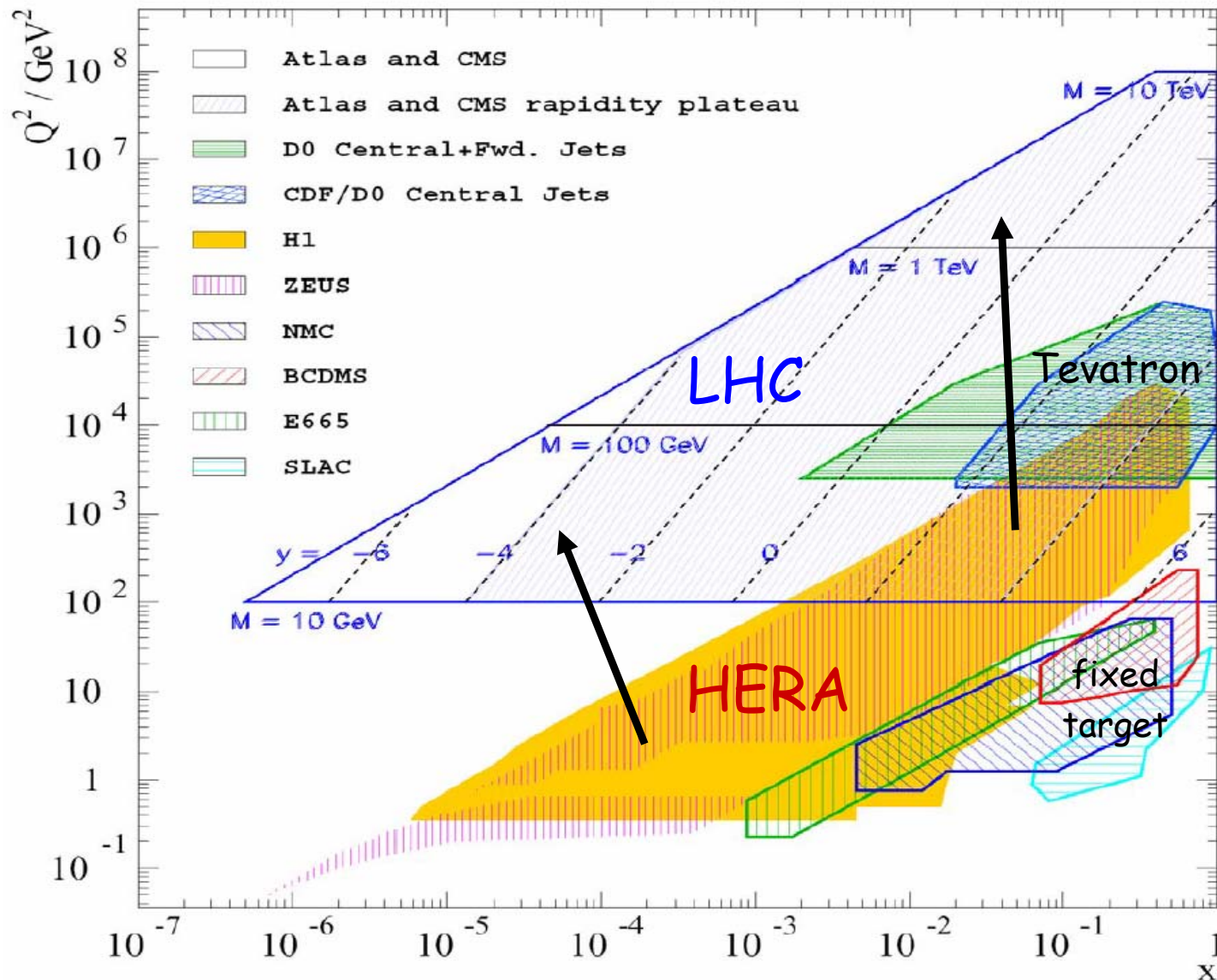
DGLAP QCD evolution:
 sea quarks, $g \rightarrow q\bar{q}$
 positive slope
 (scaling violations)
 gluon density



valence quarks
 $q \rightarrow qg$
 negative slope



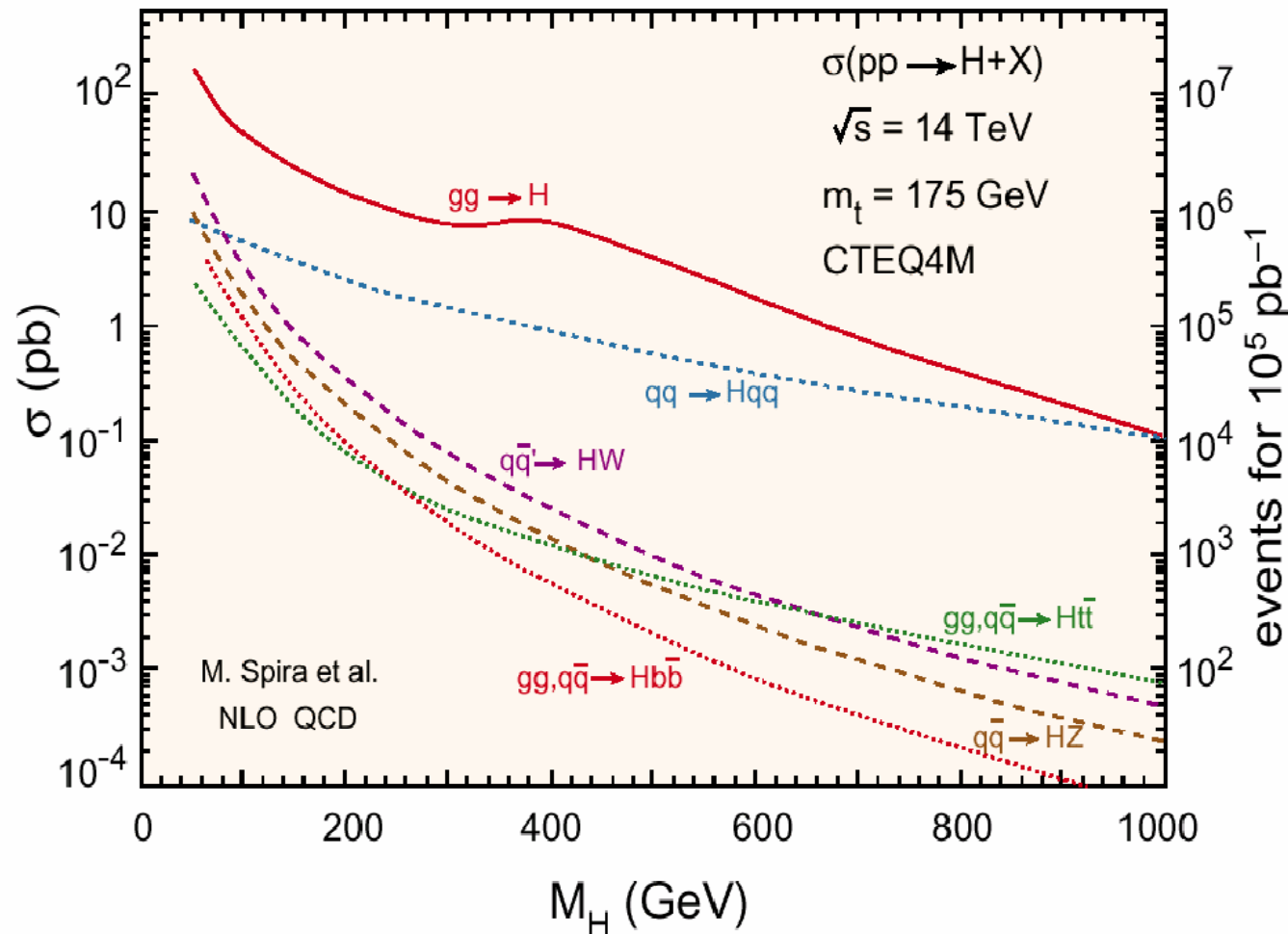
Kinematic regions: HERA vs. LHC



- proton structure measured directly for large part of LHC phase space
- QCD evolution successful
→ safely extrapolate to high Q^2 or low x

**Input to
measure-
ments
at LHC**

Beispiel: Higgs-Wirkungsquerschnitt am LHC



Higgs = essentiell für
Verständnis der Massen!
(später)

Kenntnis der Gluon- und Quark-Verteilungen essentiell!