GDR QCD

Interactions simples et multiples entre partons dans les nucléons

Kick-off meeting, some (biased) ideas for the closing discussion

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Communities : hadron structure, heavy ion at high energy, pp collisions at high energy

Kick-off meetings, 29 participants on Indico

Interface between perturbative and nonperturbative QCD

- Study of families of processes: Universality checks (*e.g.* GPDs and exclusive processes), etc.

- Predictive use for other processes (*e.g.* PDFs).

- Metrology of hadrons: What do we learn about the structure of hadrons?

- Effective description of QCD dynamics: What are the relevant effective degrees of freedom and effective interactions between them?

Proton-proton collision : initial stage

Cédric Lorcé
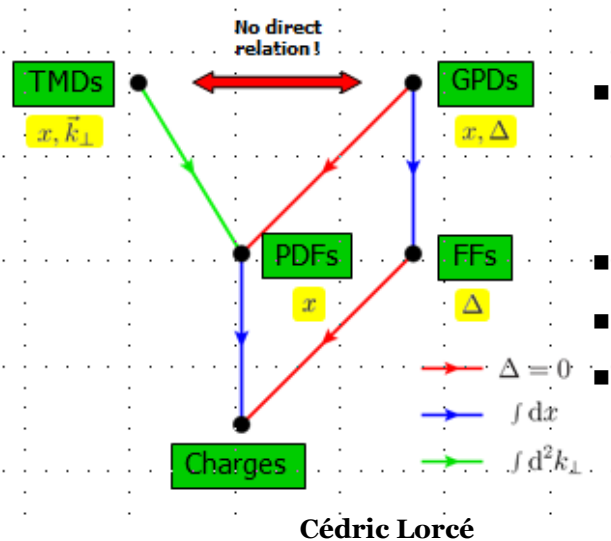
- How a better understanding of proton structure can lead to a better description of proton-proton collision at high energy ?
- Change use of PDF in the direction of TMD's or GPD's,
- Naïve guess: observable dependent, can we make a list?
- How can we use automatic codes in the context of LHC ?

→ What do we learn on nucleon structure ?

What do we learn on non perturbative regime of QCD ?

- CGC and gluon TMD's : measurement of di-jet at small x   **C. Marquet**

- Heavy quarks production (ccbar, bbar) polarization measurement: the link with TMD ?

- MPI in pp collision at high energy

    2 explicit hard interactions   **Thomas Kasemets, Y. Li**

    More interactions   **Z. Conesa Del Valle, S. Porteboeuf-Houssais**

Heavy ion initial stage

- The nucleon is not free in the nucleus   **I. Schienbein**

  Nuclear effects => (anti)-shadowing, EMC (still not understood)

  Interactions between nucleons in the nucleus

  nPDF's and realistic uncertainties

  Factorization in pA and AA?
  Which observables can probe factorization breaking ?

  Alternative to nPDF's ?

- Link with initial stage in pp
  with CGC done in some region of the phase space
  with MPI ?
  Extension of DPS framework to pA and AA   **C. Hadjdakis**
  nuclear GPD's?

TOOLS

- Event generators level

- Data Fits to extract properties : nucleon tomography, PDF, nPDF, GPD (PARTON)

- Impact of lattice QCD development?

- …

What can we do together during next 4 years ?