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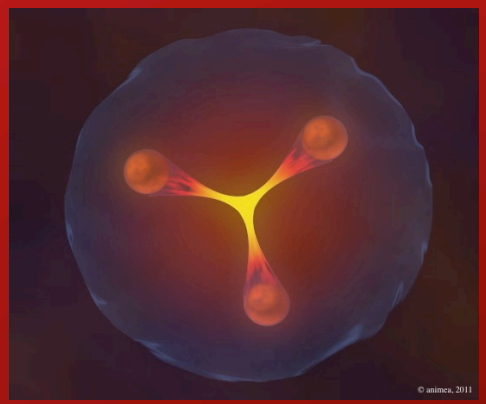
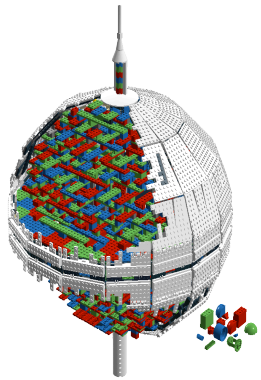
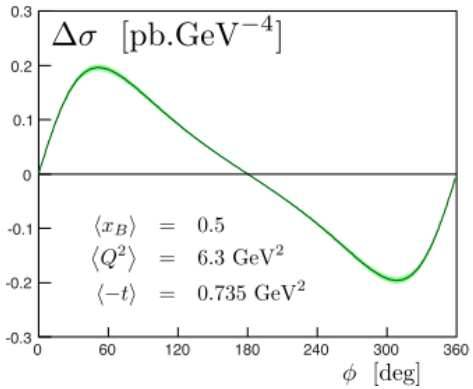
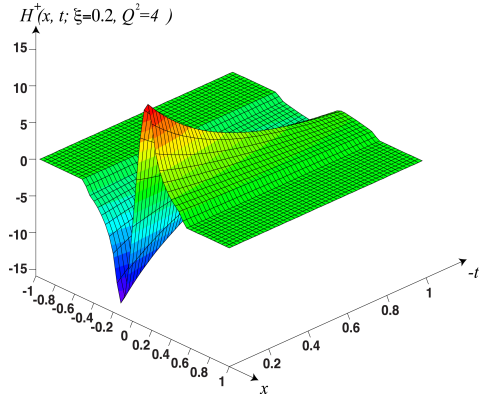


3D hadron structure with the PARTONS framework







EIC EoI on Software | Hervé MOUTARDE

université PARIS-SACLAY

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About PARTONS.

Short status and prospect.

- Collection of tools to **systematically relate** models to **experimental data** in **multi-channel** analysis and fits.
- An **homogeneous framework** for 3D hadron structure studies: initially designed for GPDs and exclusive processes, will be extended soon to TMDs.
- Recently interfaced to `APFEL++` and `LHAPDF`, about to be interfaced to `NangaParbat`.
- Recently interfaced to the **MC event generator** `MILOU` within EIC YR studies on exclusive processes.
- Plans to **further develop/interface to generic tools** for MC event generator for GPDs and TMDs.
- **Open source release** `http://partons.cea.fr`, also available on `GitLab`.

Meeting software needs.

Useful each time an observable should be predicted.

- Requirements.
  - Now: **input for event generation** with various assumptions (pQCD, nonperturbative models, etc.).
  - At completion: **high-level physics analysis** of new measurements for a first discussion.
- Technologies and techniques.
  - Future EIC software tools would benefit from a natural **interface to a framework computing theoretical predictions** (*e.g.* to input an event generator).
  - *Let's avoid reinventing the wheel!*
- Resources.
  - **On-going collaboration** between CEA (Saclay), NCBJ (Warsaw), BNL and SBU on the interface to `MILOU`.
  - Scope of joint developments (including number of people involved) could be extended if interest from EIC Coll.

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