



'The strong interaction at the frontier of knowledge: fundamental research and applications'

VA2 – Virtual Access to 3DPartons (3DPartons)

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STRONG-2020 Kick-off meeting

October 23-25, 2019

○ WP objectives

- Aggregate, improve and homogenize existing codes written by independent groups from the GPD and TMD communities: **ensure interoperability**.
- Maintain and release robust, flexible, validated and up-to-date *open source* codes to the experimental and theoretical 3D hadron structure community: **foster progress**.
- Provide documentation, technical assistance and perform nonregression tests: **facilitate dissemination**.
- Promote *Open Data* and *Open Science*: **build on previous research and get new results faster**.

○ WP tasks

- Flexible software architecture for GPD and TMD codes, elaborating on existing libraries and benefiting from experience from the PDF community.
- Generic MC event generators for GPDs and TMDs.
- Associated tools to compare theoretical calculations to experimental data.
- 3DPartons workshops and training schools.
- Webpage, software forge and mailing lists.
- Interact with relevant Work Packages of STRONG-2020.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093.

○ Possible interactions with other Work Packages

- TA6-Transnational Access to ECT*
- TA7-Transnational Access to CERN
- NA1-QCD physics at GSI/FAIR
- NA6-LatticeHadrons
- VA1-Automated perturbative NLO calculations for heavy ions and quarkonia
- NA2-Small-x Physics at the LHC and future DIS experiments
- JRA2-Fixed Target Experiments at the LHC
- JRA4-3D structure of the nucleon in momentum space
- JRA5-Generalized Parton Distributions
- JRA6-Challenges for next generation DIS facilities

STRONG VA2-3DPartons: Update on progress

2020

○ Selection of a candidate: Valerio Bertone

- QCD codes: NangaParbat, APFEL, xFitter, NNPDF, aMCfast, MELA, ...
- Work experience: PDFs, TMDs, parton showers, fragmentation functions, ...
- Start of employment in CEA targetted on 03 Feb. 2020.



○ First steps and near-future plans

- GPD evolution equations implemented in APFEL, connection to the PARTONS framework.
- First thoughts about the extension of the PARTONS framework to TMDs.
- First thoughts about MC event generation.
- Preparation of the first “**3DPartons Week**” in Spring 2020 with lectures on TMDs, tutorials on TMD / GPD codes, and general discussions with users and collaborators.
- Constitution of a board of experts.

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○ Board of experts: aim

- Evaluate work done within VA2-3DPartons and guarantee its usefulness to the 3D hadron structure community: **maximize impact**.
- Advice on development, maintenance or dissemination plans, on technical choices (physics, numerical analysis, data analysis, ...), on licensing policy, etc.: **help dealing with a transversal project**.

○ Board of experts: identified members

- Jérôme Bobin (IRFU, CEA)
- Markus Diehl (DESY, Hamburg)
- Alexander Glazov (DESY, Hamburg)
- Barbara Pasquini (INFN, Pavia)
- Daria Sokhan (University of Glasgow)
- Code development, waiting for an answer.
- TMD, experiment, waiting for an answer.
- Event generators, waiting for an answer.

- A deliverable “Virtual Access provision - multi annual implementation plan over the first 18 months” is due M18 (November 2020)
- Advancement
 - Connection between PARTONS, APFEL and LHAPDF.
 - On-going reflection on a joint software architecture for GPDs and TMDs.
 - Common webpage to facilitate access to relevant codes (source and documentation).
- Expected delivery date
 - **Software:** continuous integration and release.
 - **Report:** on M18, synthesis of work already done and description of foreseen technical solutions and development plans.