

LDRD Q3

LD2412

Gravitational Form Factor

Alexandre Camsonne

July 16th 2024

Q3 meeting

Progress report

- Updates

- Postdoc hired : Melany Higuera started May
- Implementation of Dispersion Relation with Gepard
- First LQCD results for GFF
- General database of existing experimental data format defined and script to convert existing data being tested
- Start writing draft of paper

- Issues

- Delay of start of postdoc by 2 months because of visa paperwork
- A bit behind on labor because of availability

Team :

Volker Burkert

Pierre Chatagnon

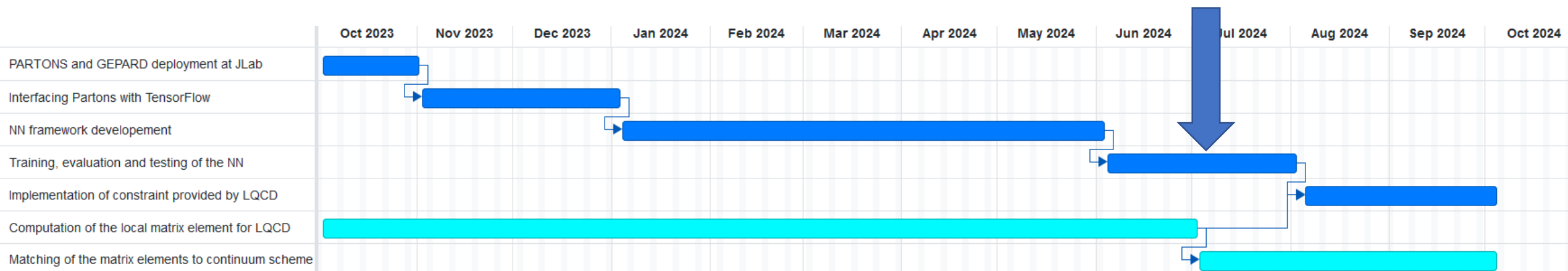
David Richards

Herve Dutrieux (WM)

Melany Isela Higuera

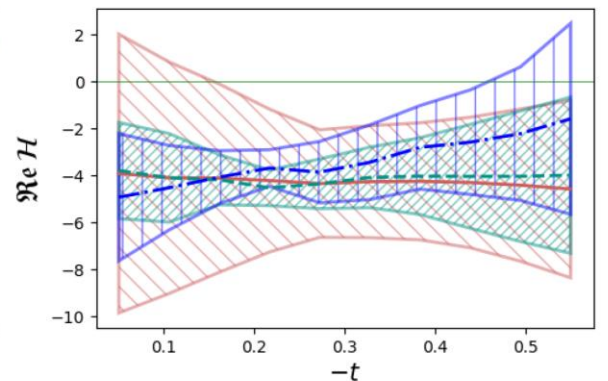
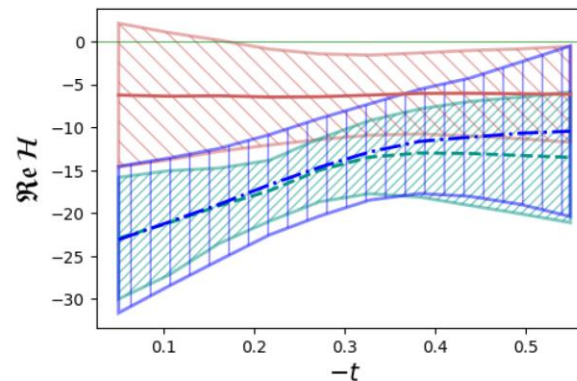
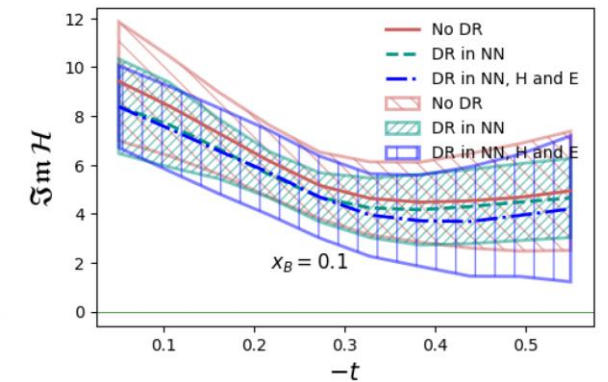
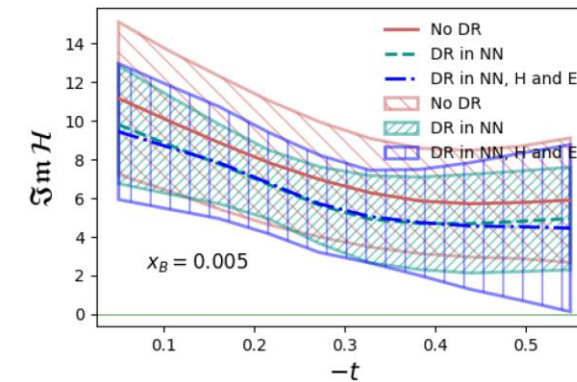
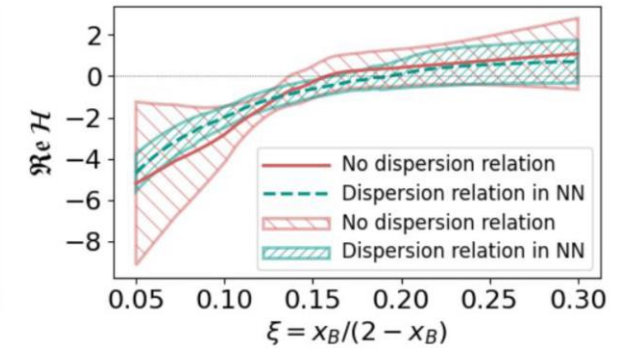
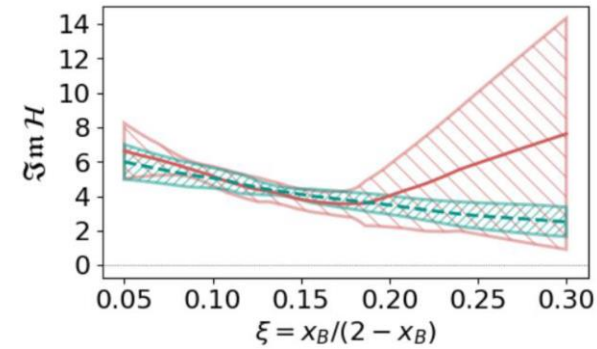
Christopher Chamness (WM)

Kishan Rajput



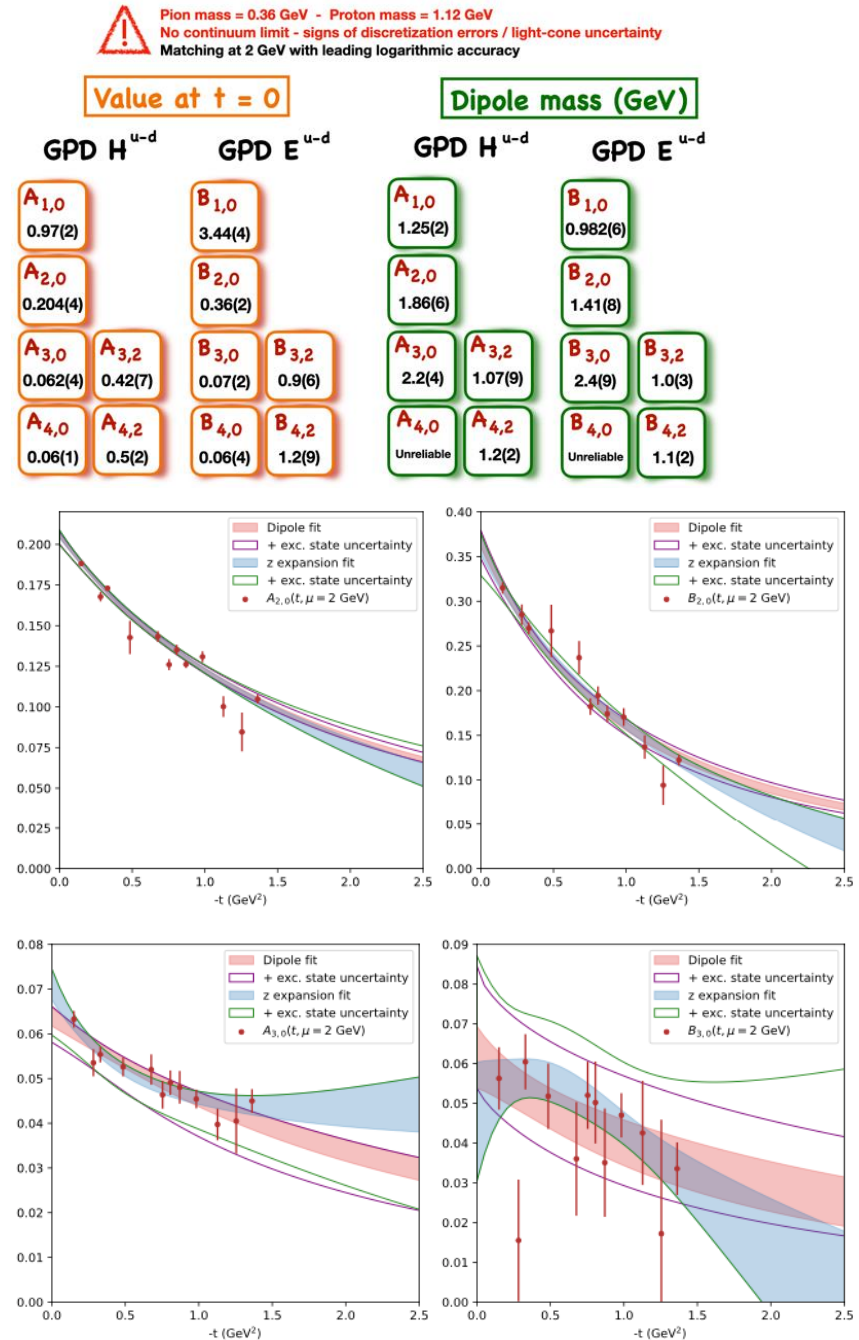
Progress AIML/NN

- GEPARD with Pytorch
- CFF fit working tested on 6 GeV data
- Fit with and without Dispersion Relation
- Will redo fit with 11 GeV when data is added to database



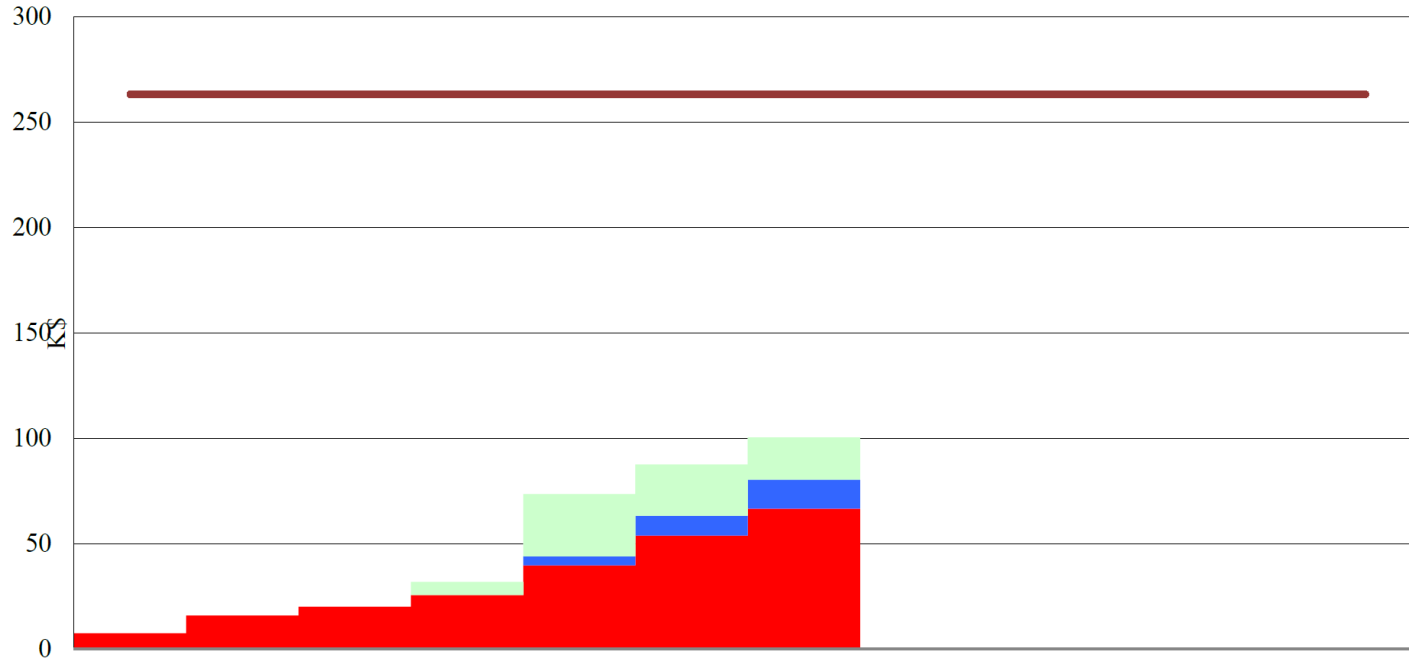
Progress LQCD

- the isovector, unpolarized Generalized Parton Distributions $H^{u-d}(x, \xi, t)$ and $E^{u-d}(x, \xi, t)$, were obtained at a pion mass of around 350 MeV
- The first and second Mellin moments of the skewness-independent GPDs. The fit of the data points, using a dipole or model-independent z expansion is shown as the shaded bands



Financial report

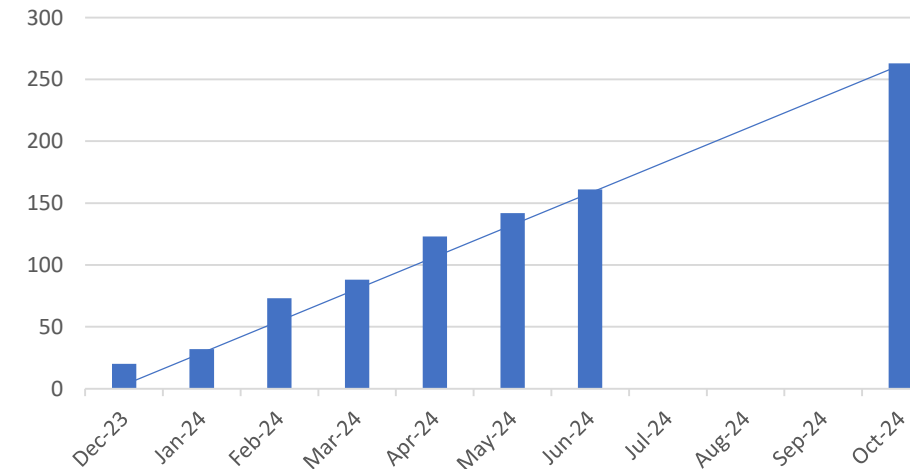
GRAVITATIONAL FORM FACTOR AND MECHANICAL PROPERTIES OF THE PROTON
A. CAMSONNE (LD2412)
WBS 1.03.LD.013 (Loaded \$k)



	Current July	Target	Remaining
Rajput, Kishan	0.1	2.2	2.1
Camsonne, Alexandre	8.1	11	2.9
Chatagnon, Pierre	2.7	6.6	3.9
Higuera Angulo, Melany	7.4	33	25.6
Burkert, Volker	3.7	6.3	2.6
Richards, David	1.1	2.2	1.1

	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
YTD Spending	7	16	20	32	73	88	100	0	0	0	0	0
Pending	0	0	0	0	0	0	0	0	0	0	0	0
Open Obligations	0	0	0	6	30	24	20	0	0	0	0	0
Expenses	0	0	0	0	4	9	14	0	0	0	0	0
Labor	7	16	20	26	40	54	67	0	0	0	0	0
Funding	263	263	263	263	263	263	263	263	263	263	263	263
3-Mo Avg Projection												

LDRD GFF



Talks and publication

- Talks, conferences, workshop
 - Presentation at positron worksop in March 2024
 - QCD Evolution 2024 (University of Pavia, Italy), “Generalized parton distributions from lattice QCD and experimental data” - speaker: Herve Dutrieux, May 2024.
 - Theory Seminar (CPT Marseille, France), “Calculation of GPDs on the lattice” - speaker: Herve Dutrieux, May 2024.
 - GPD workshop GFF session Incheon, Korea June 2024
 - ECT Trento Workshop August 2024
- Papers
 - GFF paper ongoing writing
 - H. Dutrieux *et al.* (Hadstruc Collaboration), “Towards Unpolarized GPDs from Pseudo-Distributions”, arXiv:2405.10304 – under review.