Workshop Report on
"Nucleon and Resonance Structure with Hard Exclusive Processes"

May 29-31, 2017

IPN-Orsay, France

Kyungseon Joo (UConn) and Silvia Niccolai (IPN-Orsay) for the organizing committee

1. Introduction

The 3-day workshop focused on new approaches to exploring the short-range structure of baryons and non-perturbative QCD phenomena such as chiral symmetry breaking confinement using hard exclusive electromagnetic processes. Particular emphasis was placed on a unified description of processes in the deep-exclusive regime (generalized parton distributions (GPDs)) and the resonance region (N* physics).

2. Workshop Organization

The workshop took place at IPN-Orsay, France from May 29 through May 31, 2017. The organizing committee consisted of:

- K. Joo (UConn)
- S. Noccolai (IPN-Orsay)

The workshop also had a special session to honor Prof. Paul Stoler's career, following his recent retirement, and another session devoted to the scientific partnership between US, France, and South Korea. More details on the workshop can be found under https://indico.in2p3.fr/event/14398/.

3. Workshop Summary

The workshop consisted of 42 talks and discussion and summary sessions. 48 participants from 8 countries attended the workshop. A detailed list of the talks and participants can be found on the workshop web page (https://indico.in2p3.fr/event/14398/). The workshop brought together experts in perturbative QCD, phenomenology of electromagnetic processes, and dynamical models of hadron structure, to discuss the impact of present and future experiments (particularly with the JLab 12 GeV upgrade), assess the reach of present theoretical methods, identify directions for further development, and enable joint approaches to the study of GPDs and N* physics. Topics included:

- Status and perspectives of GPD analysis
- Chiral-even GPDs and DVCS

- Chiral-odd GPDs and pseudoscalar mesons
- Gluon GPDs and vector mesons
- Reaction models for N* production
- QCD-based approaches to N* transition form factors
- Transverse densities of baryon resonances
- Dispersion relations for exclusive processes
- Joint simulation tools for GPDs and N* physics

The workshop began on Monday morning, and finished on Wednesday afternoon. We designed an agenda to allow ample discussions after each of the presentations. We also had a session in Wednesday afternoon, which was dedicated to discussions of the path forward so as to facilitate bringing the communities of theorists, phenomenologists, and experimentalists together to ensure the greatest physics outcomes.

Fees for all participants were waived to encourage more participants, and we especially encouraged young researchers and students to attend the workshop and give a presentation. Young speakers are listed below:

- Ferrero, Andrea (CEA-Saclay, graduate student)
- Fuchey, Eric (University of Connecticut, postdoc)
- Hutaurk, Parada (APCTP, postdoc)
- Jeong, Kiesang (APCTP, postdoc)
- Mezrag, Cedric (Argonne, postdoc)
- Tezgin, Kemal (University of Connecticut, graduate student)

4. Budget

The workshop was partially supported by the JSA Initiatives Fund Program at the level of $1,750, which was used for supporting one of key speakers who had limited funds: C. R. Ji (NCSU).