Introduction to the Jets and Heavy Quarks Working Group

Kick-off Meeting, February 26, 2020

EIC Physics and Detector Conceptual Development

As discussed at the annual meeting in Paris in July, we are in the process of organizing a 12-18 month intensive study of the EIC physics and detector concepts by the members of the EIC users group. This study seeks to build on the 2014 EIC White Paper and the 2018 NAS science assessment and will be complementary to the ongoing R&D at laboratories and universities worldwide. The study is open to all EICUG members and we would particularly encourage participation by colleagues from universities.

We are proposing that sub-groups of EICUG members would consider in detail specific experiments using realistic accelerator and detector concepts over about a year and write a summary of about 15 pages in length. These studies should use, in so far as possible, the current accelerator and detector concepts and simulations should be carried out using the EICUG developed software tools. The summaries would be edited and published in a volume, in the style of the CERN Yellow Reports.

We envision a 2-day kick-off meeting in fall 2019, regular workshops about every 4 months and a meeting in spring 2021 to finalize the reports. We are in the process of putting in place an organizational structure. Suggestions and advice are welcome.

The EICUG Steering Committee

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Yellow Report:

Kick-off Meeting at MIT in Dec. 2019, c.f. https://www.jlab.org/indico/event/348/

Three main working groups:
- **Physics Working Group**
- Detector Working Group
- Accelerator Working group

Physics Working Group:
- Inclusive reactions
- Semi-inclusive reactions
- **Jets, Heavy Quarks**
- Exclusive reactions
- Diffractive reactions & tagging

That is, the physics working group is organized along processes.

Physics topics linked to processes & measurements — *White Paper & NAS measurements*

Processes↦ / ↧ Topics	Inclusive	Semi-Inclusive	Jets, Heavy Flavor	Exclusive	Diffractive, Forward Tagging
Global properties and parton structure	Incl. SF	h, hh	j, Q	excl. J/Ψ, Υ	Incl. diffr., tagged DIS on pol. D/He
Imaging		h	j, jj, j+h, Q+Qbar, [QQbar]	Excl-DIS: DVCS, DVMP (J/Ψ, Υ, ρ^0, ϕ, π+, K, ρ+, K*...), Elastic scattering	
Nucleus	Incl. SF	h, hh	j, jj, Q, [QQbar]	coh. VM, jj, h, hh	Diffr. SF, incoh. VM, jj, h, hh D/He FF, nucl. fragments
Hadronization		h, hh, j+h	j, Q		
Other fields		CC DIS, γ-A total X-sec		γ-A elast. X-sec	γ-A diffr. X-sec

Carlos Munoz et al, at the MIT kick-off meeting

Note, however, that the Yellow Report will not (likely) be organized along processes;
See http://www.eicug.org/web/content/yellow-report-initiative for the outline.

First workshop at Temple University upcoming March 19-21, just before DIS 2020,
See http://eicug.org - please let us know if/how you will participate.

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Mailing list, eicug-yr-physics-jets-hf@eicug.org, currently has 55 members

Suggest to use Indico hosted at BNL for our meetings, under:
https://indico.bnl.gov/category/290/

Suggest to use BlueJeans for our meetings,
Today: https://bluejeans.com/913066124
The ID will change going forward, but will be posted and in Indico

We anticipate meetings with the entire group, initially weekly, and in addition meetings of subgroups to work on topics.

To find an optimal meeting time, please fill out the Doodle poll:
https://doodle.com/poll/p4x3sz5ufetd9xnk (for a generic week)

Our aim is that our next meeting will be next week after Doodle poll results

Several other logistics tools, e.g. wiki, dropbox, are still being worked out

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Suggest to organize our work along proposed measurements:

1. Spin physics with jets – A_{LL}, Sivers function [nucleon and nuclear structure]

2. Inclusive jets and jet substructure, charge current reactions, EW structure functions [FF_S, shapes, EW structure functions]

3. GammaJet+jet, lepton-jet, di-jet correlations [TMD constraints, broadening in e+A]

4. D and B meson cross sections, modification in e+A [energy loss, hadronization]

5. Heavy flavor jet cross sections, modification and substructure in e+A, charm F_2 [transport properties of nuclei, QCD in matter, N charm content]

6. Angularities, n-jettiness [extraction of $alpha_S$]

Input sought and welcome!

Coordination/overlap with inclusive and semi-inclusive physics working groups, tracking, calorimetry, PID, integration detector w.g. simulations (!)

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Our requests to you:

1. Please fill out the Doodle poll to optimize the meeting time,
   https://bluejeans.com/913066124

2. Please let us know / share which topics you are interested in working on,

3. Please let us know which other working groups you are taking active part in,

4. Please let us know if / how you plan to participate in the first workshop at Temple University upcoming March 19-21, c.f. http://eicug.org