

## Nuclear Experiment

# The role of Spectator Fragments at an electron Ion collider

Sebastian White, Mark Strikman

(Submitted on 10 Mar 2010)

Efficient detection of spectator fragments is key to the main topics at an electron-ion collider (eIC). Any process which leads to emission of fragments or  $\gamma$ 's breaks coherence in diffractive processes. Therefore this is equivalent to non-detection of rapidity gaps in pp collisions. For example, in coherent photoproduction of vector mesons their 4-momentum transfer distribution would image the "gluon charge" in the nucleus in the same way that Hofstadter measured its charge structure using elastic scattering of  $\sim 100$  MeV electrons. Whereas he could measure the  $\sim 4$  MeV energy loss by the electron due to excitation of nuclear energy levels (Figure 1), even the energy spread of the incident beam would prevent such an inclusive selection of quasielastic events at an eIC. The only available tool is fragment detection. Since, in our example, one finds that  $\sim 100\%$  of deexcitations go through  $\gamma$ 's or 1 neutron, rarely to 2 neutron and never to protons (due to Coulomb barrier suppression), the eIC design should emphasize their detection.

Comments: 10 pages, 6 figures

Subjects: **Nuclear Experiment (nucl-ex)**; High Energy Physics - Experiment (hep-ex)Cite as: [arXiv:1003.2196v1](https://arxiv.org/abs/1003.2196v1) [nucl-ex]

## Submission history

From: Sebastian White Phd [[view email](#)]

[v1] Wed, 10 Mar 2010 20:44:35 GMT (213kb,D)

*[Which authors of this paper are endorsers?](#)*

## Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

nucl-ex

[< prev](#) | [next >](#)[new](#) | [recent](#) | [1003](#)

Change to browse by:

[hep-ex](#)

## References & Citations

- [SLAC-SPIRES HEP](#)  
([refers to](#) | [cited by](#))
- [CiteBase](#)

## Bookmark (what is this?)

 [CiteULike logo](#) [Connotea logo](#) [BibSonomy logo](#) [Mendeley logo](#) [Facebook logo](#) [del.icio.us logo](#) [Digg logo](#) [Reddit logo](#)