



High Energy Physics - Phenomenology

Two-Photon Exchange Effect Studied with Neural Networks

Krzysztof M. Graczyk

(Submitted on 6 Jun 2011 (v1), last revised 30 Aug 2011 (this version, v2))

An approach to the extraction of the two-photon exchange (TPE) correction from elastic $e p$ scattering data is presented. The cross section, polarization transfer (PT), and charge asymmetry data are considered. It is assumed that the TPE correction to the PT data is negligible. The form factors and TPE correcting term are given by one multidimensional function approximated by the feed forward neural network (NN). To find a model-independent approximation the Bayesian framework for the NNs is adapted. A large number of different parametrizations is considered. The most optimal model is indicated by the Bayesian algorithm. The obtained fit of the TPE correction behaves linearly in ϵ but it has a nontrivial Q^2 dependence. A strong dependence of the TPE fit on the choice of parametrization is observed.

Comments: 9 pages, 4 figures, the manuscript is divided into 4 sections, 5 appendixes are added, the text is enriched by the more detailed description of the Bayesian formalism, one new figure is also added

Subjects: **High Energy Physics - Phenomenology (hep-ph)**; Nuclear Experiment (nucl-ex); Nuclear Theory (nucl-th)

Cite as: **arXiv:1106.1204 [hep-ph]**
(or **arXiv:1106.1204v2 [hep-ph]** for this version)

Submission history

From: Krzysztof M. Graczyk [[view email](#)]

[v1] Mon, 6 Jun 2011 21:54:57 GMT (28kb)

[v2] Tue, 30 Aug 2011 18:20:33 GMT (42kb)

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

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

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

Current browse context:

hep-ph

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1106](#)

Change to browse by:

[nucl-ex](#)

[nucl-th](#)

References & Citations

- [INSPIRE HEP](#)
([refers to](#) | [cited by](#))
- [NASA ADS](#)

Bookmark([what is this?](#))

