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High Energy Physics - Phenomenology

Two-Photon Exchange Effect Studied with Neural Networks

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An approach to the extraction of the two-photon exchange (TPE) correction from elastic ep 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 epsilon but it has a nontrivial Q2 dependence. A strong dependence of the TPE fit on the choice of parametrization is observed.

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