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Beyond the Standard Model searches at HERA

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Summary

The search for physics beyond the Standard Model was pursued at the HERA ep collider, both for dedicated channels and general searches using the data on deep inelastic scattering. High precision and wide kinematic range of the data collected by the H1 and ZEUS experiments not only allowed determination of the proton distribution functions (PDFs) from HERA data only, but also for simultaneous fits to be performed of PDFs with parameters of the models beyond the Standard Model (BSM), providing an unbiased search for “new physics”. Such a final simultaneous analysis was performed in the framework of eeqq contact interactions, including leptoquarks, and BSM modifications of the weak couplings. No statistically significant deviation from the Standard Model was observed and the most stringent limits from HERA on the considered models were set. Limits on the compositeness scale of the general contact interactions and mass scale of the heavy-leptoquark scenarios were obtained in the TeV range. The results are compared to those from the LHC.

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