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Production of Z^0 bosons in elastic and quasi-elastic ep collisions at HERA

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A search for events $ep \rightarrow ep Z^0$ has been performed in ep collisions at HERA using the ZEUS detector. The search is based on the entire HERA-I and HERA-II data set, amounting to 0.49 fb^{-1} of integrated luminosity. The Z^0 was searched in the di-jet decay mode with elastic condition defined by $\eta_{\text{max}} < 3$, where η_{max} is defined as the pseudorapidity of the energy deposit in the calorimeter closest to the proton beam direction. A di-jet mass peak is observed at the Z^0 mass and the number of signal events is extracted from a fit to the mass spectrum. The elastic Z^0 production cross section is determined and compared to the SM prediction.

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