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Measurement of Inclusive ep Cross Sections at High Q^2 at $\sqrt{s} = 225$ and 252 GeV and of the Longitudinal Proton Structure Function FL at HERA

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Inclusive ep double differential cross sections for neutral current deep inelastic scattering are measured with the H1 detector at HERA. The data were taken with a lepton beam energy of 27.6 GeV and two proton beam energies of $E_p = 460$ and 575 GeV corresponding to centre-of-mass energies of 225 and 252 GeV, respectively. The measurements cover the region of $6.5 \times 10^{-4} \leq x \leq 0.65$ for $35 \leq Q^2 \leq 800 \text{ GeV}^2$ up to $y = 0.85$. The measurements are used together with previously published H1 data at $E_p = 920$ GeV and lower Q^2 data at $E_p = 460, 575$ and 920 GeV to extract the longitudinal proton structure function FL in the region $1.5 \leq Q^2 \leq 800 \text{ GeV}^2$.

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