

# Proton structure functions in the resonance region

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Nucleon resonance contributions to the inclusive proton  $F_2$  and  $F_L$  structure functions are computed from resonance electroexcitation amplitudes in the mass range up to 1.75 GeV extracted from CLAS exclusive meson electroproduction data. Taking into account for the first time interference effects between nucleon resonances, the resonant contributions are compared with inclusive proton structure functions evaluated from cross section data and the longitudinal to transverse cross section ratio. Contributions from isospin-1/2 and 3/2 resonances remain substantial over the entire range of photon virtualities  $\lesssim 4 \text{ GeV}^2$ , where their electroexcitation amplitudes have been obtained, and their  $Q^2$  evolution displays pronounced differences in the first, second and third resonance regions. We compare the structure functions in the resonance region with those computed from parton distributions fitted to deep-inelastic scattering data, and extrapolated to the resonance region, providing new quantitative assessments of quark-hadron duality in inclusive electron-proton scattering.