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Differential (2+1) Jet Rates and Determination of α_s in Deep-Inelastic Scattering at HERA

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Events with a (2+1) jet topology in deep inelastic scattering at HERA are studied in the kinematic range $200 < Q^2 < 10\,000$ GeV^2. The rate of (2+1) jet events has been determined with the modified JADE jet algorithm as a function of the jet resolution parameter and is compared with the predictions of Monte Carlo models. In addition, the event rate is corrected for both hadronization and detector effects and is compared with next–to–leading order QCD calculations. A value of the strong coupling constant of $\alpha_s(M_Z^2)$=0.118 $\pm$ 0.002 $(stat.)\ ^{+0.007}_{-0.008}\ (syst.)\ ^{+0.007}_{-0.006}\ (theory)$ is extracted. The systematic error includes uncertainties in the calorimeter energy calibration, in the description of the data by current Monte Carlo models, and in the knowledge of the parton densities. The theoretical error is dominated by the renormalization scale ambiguity.