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Search for collective behaviour and multiparton interactions in ep scattering at HERA (20+5)

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Collective behaviour of final-state hadrons is studied in ep scattering using the H1 and ZEUS detectors at HERA. Measurements of two- and four-particle azimuthal correlations in both DIS and photoproduction are presented. Ridge yields are extracted from fits to two-particle correlations with H1 data. Comparisons of the magnitudes and signs of the first- and second-harmonic of two-particle correlations are made with ZEUS data. Four-particle cumulant correlations are observed to be positive. The results do not indicate the kind of collective behaviour observed at RHIC and the LHC in high-multiplicity hadronic collisions. The possibility of multiparton interactions are studied in photoproduction with ZEUS. Comparisons of PYTHIA predictions with the measurements strongly indicate the presence of multiparton interactions from hadronic fluctuations of the exchanged photon.

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