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Search for collectivity in ep collisions at HERA with the H1 experiment

Measurements of two- and multi-particle angular correlations in DIS and photoproduction ep collisions at $\sqrt{s} = 319$ GeV are presented as a function of charged particle multiplicity. The data were collected using the H1 detector at HERA. Since no long-range ridge structure is observed in the correlation functions over the full multiplicity range, upper limits of ridge yield are provided as functions of particle multiplicity. The second-order ($V_{2\Delta}$) and third-order ($V_{3\Delta}$) azimuthal anisotropy Fourier harmonics of charged particles are extracted from long-range two-particle correlations as functions of particle multiplicity. The $C_2\{4\}$ signals are also extracted from four-particle correlations for the first time in ep collisions, which are positive or consistent with 0. These observations do not indicate the kind of collective behavior observed at the RHIC and LHC in high-multiplicity hadronic collisions.

H1prelim-20-033 https://www-h1.desy.de/psfiles/confpap/IS2021/H1prelim-20-033.pdf

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