Event texture search for critical fluctuations in Pb+Pb collisions at the CERN SPS

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Abstract

NA44 uses a Si pad array covering pseudorapidity 1.5 ¡ eta ¡ 3.3 to study charged hardon production in 158 A GeV/c Pb+Pb collisions at the CERN SPS. We apply a multiresolution analysis, based on a Discrete Wavelet Transformation, to probe the texture of particle distributions in individual events by simultaneous localization of features in space and scale. Scanning a broad range of multiplicities, we look for evidence of critical behaviour in the power spectra of local density fluctuations. Measured results are compared with detailed simulations of detector response, using as input heavy ion event generators. An upper limit is set on the probability and magnitude of critical fluctuations.

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