

# Hadron spectra and elliptic flow in Pb-Pb collisions at the LHC energies from the (3+1)-dimensional non-extensive hydrodynamic model

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A non-extensive (3+1)-dimensional hydrodynamic model for multi-particle production processes, NEX-CLVisc, is developed in the framework of the CLVisc package where the viscous corrections are turned off. It is based on non-extensive statistics and assumes that non-extensive effects exist in the initial conditions, the equation of state and the hadron kinetic freeze-out procedure. The model is then applied to investigate the pseudorapidity ( $\eta$ ) distribution, the transverse momentum ( $p_T$ ) spectra and the  $p_T$ -differential elliptic flow ( $v_2$ ) of charged particles in Pb-Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV and 5.02 TeV. It is found that the model can reasonably reproduce the  $\eta$  distribution and the charged-particle spectra in a  $p_T$  range up to 6–8 GeV/c. When compared with the ideal hydrodynamic model, the  $p_T$ -differential  $v_2$  of charged particles is reduced in the NEX-CLVisc model, which is similar to that observed in the viscous hydrodynamic model. Moreover, the extension of the applicable range for  $p_T$ -differential  $v_2$  is not as large as that indicated by the particle  $p_T$  spectra.

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