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Elliptic flow (v_2) in pp collisions at energies available at the CERN Large Hadron Collider: A hydrodynamical approach

Content :

The term collectivity denotes a common feature that is observed for several particles emerging from one reaction. Collective flow is the prototype of such a common feature and describes a movement of a large number of ejectiles either in a common direction or at a common magnitude of velocities. The elliptic flow v_2 is directly related to the measurement of collective effect of the system. The expected large multiplicities in pp collisions at LHC energies, suggest the creation of a system with large energy density where the hydrodynamics can be applied to determine the dynamics of the collective effect.

In this work a hydrodynamical approach has been applied to estimate the expected v_2 in pp collisions at $\sqrt{s}$ = 14 TeV. The code AZYHYDRO is used with the equation of state (EOS) consisting of lattice EOS and hadron resonance gas EOS. The matter distribution inside a proton is taken as Wood-Saxon type and two values of diffuseness parameter ξ are used. The centrality dependence and the effect of changing initial conditions [e.g., initial time (τ_i), freeze-out temperature ($\T_F$)] on v_2 of π^- is studied. v_2 of $\pi^−$ is found to be finite and positive for both ξ with a strong dependence on this parameter. The details of the hydrodynamic simulation and the results will be presented.

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