

## Wounded quark scenario for charged hadron production in $p-p$ , $p-A$ and $A-A$ collisions

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Various ultra-relativistic high energy collision experiments have been performed at different places to test the predictions of quantum chromo-dynamics (QCD). The charged hadrons produced in these experiments can reveal the nature of hadronic interactions at extreme temperature and/or density and throw light on the role played by the quarks and gluons in the particle production mechanism. Here, we propose a parameterization which is based on a phenomenological model involving the basic quark-quark interactions picture. Our model is based on simple assumptions regarding mean number of participating quarks and average number of collisions suffered by each quark. Model suitably explains the various observed features of charged hadron production such as the pseudo-rapidity density at mid-rapidity and rapidity dependence of pseudo-rapidity density for different colliding system in relativistic heavy-ion collisions. The model satisfactorily describes the role of hard and soft processes involved in the production of charged hadrons. The model also interrelates nucleus-nucleus ( $A-A$ ) collisions with proton-nucleus ( $p-A$ ) and proton-proton ( $pp$ ) interactions. The experimental results for central pseudo-rapidity density and their variations with the mass number of colliding nuclei and center-of-mass energy available till date are well explained by the model results. We also give the predictions for charged hadron multiplicity from our model for  $A-A$  collisions at the Large Hadron Collider (LHC) and Compressed Baryonic Matter (CBM) experiments. The model provides a possible universal mechanism of charged hadron production in  $pp$ ,  $p-A$  and  $A-A$  collisions and explains various observed features. Any distinct deviation observed in the data from the predictions of the model will provide a hint for QGP formation.

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