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Baryon-antibaryon Asymmetry in p-p, p-A collisions and String Junction Torus as Baryonium DM

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The asymmetry of baryon/antibaryon production has been measured in many proton-proton, pion-proton and electron-proton experiments. In the framework of Quark-Gluon String Model (QGSM) the energy dependence of asymmetry tells us about the value of $\alpha_{SJ}(0)$, the intercept of String Junction Regge trajectory. In previous QGSM study, the value of intercept has been estimated as $0.5 < \alpha_{SJ}(0) < 0.9$. Here, SJ behaviors are accumulated in the model based on topological expansion in order to build a neutral object with zero baryon charge. By the way, QCD mass falling under the event horizon of Black Hole (BH) should be symmetric, or in other words, have no charge information. The baryon junctions are easily combinable with antibaryon ones in hexagons. Topologically, hexagon net can coherently cover only the torus surface. The net on the torus has discrete number of baryon/antibaryon junctions. This is only parameter that marks the mass/energy level of this object. It looks like DM particle, is not it? In high energy collisions at LHC, such pomeron loops are to be produced approximately in 1.2 percent of inelastic events. Furthermore, the torus configurations of matter have been revealed in many bright events in space. As an example, Chandra experiment has detected such dense "doughnut" near the event horizon of Super Massive Black Hole (SMBH), which X-ray radiation is screened on 40 percent's. This topological symmetry model of DM seems rather realistic and can help us to deal with an "arm wrestling" between the stiffness of toroid structure of QCD matter and the pressure of gravitational singularity at extremely heavy masses. On the other hand, the instabilities in structure of matter in SMBHs can cause the bursts of giant relativistic hadron jets with the masses of order the own BH mass.

The speaker is a student or young scientist

No

Section

1. Neutrino physics and nuclear astrophysics

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