Anomaly Induced DCC Formation and Its Experimental Signatures

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We have suggested that the chiral U(1) anomaly may provide an efficient trigger mechanism for formation of coherent domains of pion fields, the disoriented chiral condensate (DCC), in heavy ion collisions. We have demonstrated that this mechanism indeed enhances the DCC formation by implementing the anomaly effect into the linear sigma model simulation code prepared by Asakawa et al.. A compact summary will be made on these developments.

Then we discuss characteristic experimental signatures related to the anomaly-induced DCC formation in relativistic heavy ion collisions. We predict that the enhancement of the fraction of neutral pions compared to all pions depends on the angle of emission with respect to the scattering plane and is concentrated at small transverse momentum and small rapidity in the center-of-mass frame. We also compute the inclusive photon distribution which is easier to measure at RHIC and confirmed that the anisotropy with respect to the reaction plane prevails in this observable.