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Disoriented Isospin Condensates as source of anomalous kaon correlations at LHC

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Heavy-ion collision experiments produce the deconfined state of nuclear matter, the quark-gluon plasma (QGP). At QGP temperatures, the vacuum condensate is expected to melt leading to the restoration of the approximate chiral symmetry of QCD. As the plasma expands and cools, the chiral condensates are formed again. So far, concrete experimental evidence of this widely expected phenomena has proved elusive. The ALICE collaboration has reported anomalous correlations between charged and neutral kaons in Pb-Pb collisions at the LHC. We show that the measurements cannot be explained by usual statistical models but can be explained by invoking domains of flat neutral kaon fraction distribution. Such domains can be related to the fluctuations of the up and down quark condensates as the vacuum refreezes.

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