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An Inverse Magnetic Catalysis Effect Induced by Sphalerons

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We find that the barrier between topologically in-equivalent vacua is lowered at the presence of external magnetic field. As a consequence, the imbalanced chiral quark density arises due to the sphaleron transition at finite temperatures. It quantitatively explains and describes the unusual phenomena of the inverse magnetic catalysis, which was numerically found to happen at the transition between the hadron, low-temperature phase and hot, magnetized quark-gluon plasma. We also propose revelant singantures of this effect to be experimentally accessible in the magnetised plasma environment created in noncentral heavy-ion collisions at the LHC.

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