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Rotation Induced Novel Condensation in a Magnetic Field

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We mainly focus on the effect of rotation on the QCD phase structure in a background magnetic field. We analyze the energy spectra of Dirac fermions in the presence of rotation and magnetic field. We find that the Landau degeneracy is resolved by rotation. A drastic change in the energy dispersion relation leads to the "rotational magnetic inhibition"that is a novel phenomenon analogous to the inverse magnetic catalysis in a magnetic system at finite chemical potential. Then we take in to account the boundary condition to perserve the casuality find that mode accumulation at the boundary occurs for large angular momenta and that the magnetic effect is enhanced on the boundary surface. Using a simple fermionic model, we confirm that the magnetic catalysis is strongly amplified at the boundary due to the mode accumulation. Besides, we also find that there is a competition between the rotational inhibition of the spin zero pairing and the enhancement of the pion BEC.

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