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## The Chiral Magnetic Effect and symmetry breaking in SU(3) quenched theory

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We study properties of the non-Abelian vacuum in the presence of constant external magnetic field within the quenched SU(3) lattice gauge theory with tadpole-improved Wilson-Symanzik action and using the chirally invariant lattice Dirac operator. We have found that the magnetic field enhances the chiral symmetry breaking in the confinement phase as well as the local fluctuations of both electric/chiral charge and electromagnetic current in direction of the magnetic field. These fluctuations can be recognized as evidence of the Chiral Magnetic Effect (CME), which is observed by the STAR Collaboration in heavy ion collisions at RHIC. The paramagnetic polarization of the quarks' spins in strong magnetic field has been also observed in our simulation and the chiral magnetization as a function of the field strength has been calculated using near-zero eigenmodes of overlap fermions.

We also investigate the correlator of two vector currents in this theory and extract the electric conductivity of the vacuum from the spectral function, which corresponds to this correlator.

**Primary author:** KALAYDZHYAN, Tigran (DESY-Hamburg)

**Co-author:** Prof. POLIKARPOV, Mikhail (ITEP-Moskow)

**Presenter:** KALAYDZHYAN, Tigran (DESY-Hamburg)

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