

Charge gap in SU(3) Yang-Mills with nonlinear spinor field

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Particlelike solutions can be configured in SU(3) Yang-Mills theory with color electric and magnetic fields created by a nonlinear spinor field. Then it can be shown that the electric field expresses the Coulomb asymptotic behavior, whereas one of color components of the magnetic field behaves asymptotically like the field of a magnetic dipole. Therefore the corresponding charge and magnetic moment can be determined. The profiles of the color charge and magnetic moment have global minimum, which may be called charge and magnetic moment gaps. The relationship between the total energy of the system and the color charge is provided. Discussion to find physical reason for the appearance of the mass, charge, and magnetic moment gaps is open.

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