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The neutron electric dipole moment revisited

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In QCD there is the possibility of strong CP violation arising from a nonvanishing vacuum angle θ , which would result in an electric dipole moment d_n of the neutron. Recently it has been shown that QCD undergoes a deconfinement phase transition at finite values of θ due to long-distance vacuum effects, which rules out any CP violation at the hadronic level, thus solving the strong CP problem by itself. To verify this statement we compute the electric dipole moment d_n . The calculation is done by rotating the θ term into the mass matrix and by simulating the action for imaginary values of θ , which allows us to probe a wider range of θ values.

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