



Dipartimento di Fisica
Università di Cagliari
INFN, Sezione di Cagliari



HIGH ENERGY PHYSICS COLLOQUIA

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THETA DEPENDENCE IN HOLOGRAPHIC QCD

Abstract

Using the holographic gauge/gravity duality as a tool, I will consider the effects of the CP-breaking topological theta term in the large N QCD-like model by Witten, Sakai and Sugimoto. I will first focus on the ground state energy density, the topological susceptibility and the masses of the lowest lying mesons, showing agreement with expectations from the chiral effective action. Then I will consider the baryonic sector in the case with two degenerate light quarks. I will show that while the baryon spectrum does not receive corrections to first order in theta, this is not the case for observables like the electromagnetic form factor of the nucleons. In particular, it exhibits a dipole term, which turns out to be vector-meson dominated. The resulting neutron electric dipole moment, which is exactly the opposite as that of the proton, is of the same order of magnitude of previous estimates in the literature.

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