Nucleon D-term in holographic QCD

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The D-term is one of the conserved charges of hadrons defined as the forward limit of the gravitational form factor D(t). We calculate the nucleon's D-term in a holographic QCD model in which the nucleon is described as a soliton in five dimensions. We show that the form factor D(t) is saturated by the exchanges of infinitely many 0++ and 2++ glueballs dual to transverse-traceless metric fluctuations on the Wick rotated AdS7 black hole geometry. We refer to this phenomenon as 'glueball dominance', in perfect analogy to the vector meson dominance of the electromagnetic form factors. However, the value at vanishing momentum transfer D(t = 0) can be interpreted as due to the exchange of pairs of pions and infinitely many vector and axial-vector mesons without any reference to glueballs. We find that the D-term is slightly negative as a result of a cancellation between the isovector and isoscalar meson contributions.

Primary author: Dr FUJITA, Mitsutoshi (Sun Yat-Sen University)

Presenter: Dr FUJITA, Mitsutoshi (Sun Yat-Sen University)

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