Axial anomaly low-energy theorems and the instanton vacuum

Hyun-Chul Kim[a] and M.M. Musakhanov[b]

[a] *Department of Physics Pusan National University 609-735 Pusan, The Republic of Korea hchkim@pusan.ac.kr*
[b] *Theoretical Physics Dept, Uzbekistan National University, Tashkent 700174, Uzbekistan musakhanov@nuuz.uzsci.net*

The QCD+QED axial anomaly low-energy theorems give an exact relation between the matrix elements of the gluon and the photon parts of the axial anomaly operator equation [1]. The matrix elements between the vacuum and two photon states and between the vacuum and two gluon states are calculated for arbitrary N_f in an *effective action* approach [2], based on the instanton-vacuum model in the chiral limit. Having gauged the effective action properly, we show that the model does exactly satisfy the low-energy theorems.

References

[1] M. M. Musakhanov, F. C. Khanna, *Phys. Lett.* **B 395** (1997) 298.
[2] D.I. Diakonov, M.V. Polyakov, C. Weiss, *Nucl. Phys.* **B 461** (1996) 539.