

Gasser-Leutwyler Coefficients of Chiral Lagrangian for Pseudoscalar Goldstone Bosons

ZHOU Li -Juan,¹ WU Qing,² PAN Ji -Huan,³ MENG Cheng-Ju,³ MA Wei -Xing,^{1,4} and LI Xi -Guo⁵

¹ Collaboration Group of Hadron Physics and Non-perturbative QCD Study, Guangxi University of Technology, Liuzhou 545006, China

² Department of Physics, Qingdao University, Qingdao 266071, China

³ Department of Physics, Hechi College, Yizhou 546300, China

⁴ Institute of High Energy Physics, the Chinese Academy of Sciences, Beijing 100049, China

⁵ Institute of Modern Physics, the Chinese Academy of Sciences, Lanzhou 730000, China

(Received: 2005-10-11; Revised:)

Abstract: Based on the Dyson-Schwinger equations in rainbow approximation for quark propagator with an effective gluon propagator, and on the parametrized fully dressed quark propagator proposed by us, the unknown Gasser-Leutwyler coefficients of the chiral Lagrangian for pseudoscalar Goldstone bosons, L_i , are predicted respectively. The predicted values of L_i in the two different ways are not only in reasonable agreement each other but also in agreement with empirical values used widely in literature and the values predicted by many other theoretical models with QCD characteristics. The compatible results of Gasser-Leutwyler coefficients predicted by our parameterized quark propagator, in turn, clearly verify its extensive validity.

PACS: 11.30.Rd, 11.38.Cy, 12.38.Lg, 12.39.Fe

Key words: chiral perturbation theory, Gasser-Leutwyler coefficient, quark propagator, Dyson-Schwinger equations

[\[Full text: PDF\]](#)

Close