

Masses and Sigma Terms of Pentaquarks in Chiral Perturbation Theory

LI Xiao-Ya¹ and LÜ Xiao-Fu^{1,2,3}

¹ Department of Physics, Sichuan University, Chengdu 610064, China

² Institute of Theoretical Physics, the Chinese Academy of Sciences, Beijing 100080, China

³ China Center of Advanced Science and Technology (World Laboratory), Beijing 100080, China

(Received: 2005-11-30; Revised:)

Abstract: Assuming that the recently θ^+ and other exotic resonances belong to the pentaquark $\overline{10}$ of $SU(3)_f$ with $J^P=1/2$, we constructed a relativistic effective lagrangian in the frame work of baryon chiral perturbation theory. The masses of pentaquarks under isospin symmetry is determined by calculating the propagator to one loop, where the extended on-mass-shell renormalization scheme is applied. Using the experimental data for masses of θ^+ , Ξ and N , we estimated the mass of Σ and the σ terms.

PACS: 24.85.+p, 12.38.Lg, 11.15.Pg

Key words: pentaquark, chiral perturbation theory, σ term

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

Close