Modified Approach for Calculating Four-Quark Condensates

ZONG Hong-Shi[1,2,3] and SUN Wei-Min[1,2]

[1] Department of Physics, Nanjing University, Nanjing 210093, China
[2] Joint Center for Particle, Nuclear Physics and Cosmology, Nanjing 210093, China
[3] CCAST (World Laboratory), P.O. Box 8730, Beijing 100080, China

Abstract: By differentiating the dressed quark propagator with respect to a variable background field, the linear response of the dressed quark propagator in the presence of the background field can be obtained. From this general method, using the vector background field as an illustration, we extract a general formula for the four-quark condensate $\langle 0|:\bar{q}(0)\gamma_\mu q(0)\bar{q}(0)\gamma_\mu q(0):|0\rangle$. This formula contains the corresponding fully dressed vector vertex. We use this formula to analyze the factorization problem of the four-quark condensate and show that in the bare vertex approximation factorization holds exactly.

[Full text: PDF]

Close