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The high order chiral Lagrangian

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Chiral Lagrangian is a very effective tool to deal with the low-energy pseudoscalar mesons where the low-energy constants (LECs) play the important role and very difficult to be estimated. To increase the precision of chiral Lagrangian, we need to manage the high orders, which include hundreds of LECs. There are numerous operators and constraint conditions in the high orders. Up to now, all of the p_6 order structures of the chiral Lagrangian have been given, including the two and three flavors, the normal and anomalous parts, and the tensor sources parts. We review the main methods to search these constraint conditions, emphasis the method to obtain the high orders of chiral Lagrangian, introduce our method to compute all the LECs up to order of p_6 , with Schwinger-Dyson proper time method and some approximations, including the large- N_c limit, the improved, ladder approximation, and the leading order in dynamical perturbation theory. All the LECs are expressed in terms of the quark self-energy. Finally, we compare our results with others.

Primary authors: Prof. WANG, Qing (TsingHua University); JIANG, Shao-zhou (Guangxi University)

Presenter: JIANG, Shao-zhou (Guangxi University)

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