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Let's go dynamic – a quick tour through 2+1 lattice simulations to understand chiral symmetry breaking

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Several lattice collaboration performing simulations with 2+1 light dynamical quarks have experienced difficulties in fitting their data with conventional NNLO expressions from $N_f=3$ Chiral Perturbation Theory, even for quantities as simple as pseudoscalar masses and decay constants. At the same time, they have obtained rather small values of the quark condensate and/or the decay constant in the $N_f=3$ chiral limit, which implies that $N_f=3$ chiral expansions are not necessarily saturated by their leading-order term. In this case, one needs to reorder the chiral expansion to analyse $N_f=2+1$ lattice data correctly. We will present the basic elements of such reordering in the case of pseudoscalar masses and decay constants, as well as K_13 form factors. Fitting recent results from several lattice collaborations, we will describe the emerging picture for the pattern of chiral symmetry breaking, as well as the consequences for quantities of phenomenological interest such as f_K/f_π and $f_+(0)$.

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talk

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