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Flavor asymmetry from the non-perturbative nucleon sea

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We demonstrate, in the context of a scalar version of the chiral effective field theory, that the multi-sea quark contribution to the nucleon is significant and highly non-trivial in sharp contrast to the prediction of perturbation theory. The non-perturbative calculation is performed in the Fock sector dependent renormalization scheme on the light front, in which the non-perturbative renormalization is incorporated. The calculation suggests that a fully non-perturbative calculation of the chiral EFT is needed to obtain a robust result to be compared with the recent experimental measurement of flavor asymmetry in the proton.

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