Contribution ID: **84** Type: **Talk**

Quark and gluon momentum fractions in the pion and in the kaon

Thursday 1 August 2024 10:00 (20 minutes)

We present the full decomposition of the momentum fraction carried by quarks and gluons in the pion and the kaon. We employ three gauge ensembles generated with Nf = 2 + 1 + 1 Wilson twisted-mass clover-improved fermions at the physical quark masses. For both mesons we perform a continuum extrapolation directly at the physical pion mass, which allows us to determine for the first time the momentum decomposition at the physical point. We find that the total momentum fraction carried by quarks is 0.532(56) and 0.618(32) and by gluons 0.388(49) and 0.408(61) in the pion and in the kaon, respectively, in the MS scheme and at the renormalization scale of 2 GeV. Having computed both the quark and gluon contributions in the continuum limit, we find that the momentum sum is 0.926(68) for the pion and 1.046(90) for the kaon, verifying the momentum sum rule.

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Session Classification: Structure of hadrons and nuclei

Track Classification: Structure of Hadrons and Nuclei