K^+ Scattering with the Nuclear Pion from Chiral Effective Lagrangian

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Abstract: The K^+ scattering cross section with the in-medium virtual pion is evaluated in the lowest-order chiral perturbation theory with the density-dependent pion decay constant and mass. The contribution of nuclear pions to the total K^+-nucleus cross section is found to be about 5% and 12% when the excess pion numbers per nucleon $n_\pi=0.057$ and 0.13 are used. The inclusion of the off-mass-shell behavior of the $K^+\pi$ amplitude produced a significant improvement in the K^+-nucleus cross section.

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