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ChPT tests at NA48 and NA62

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Collaboration

NA48 and NA62

Abstract content

New final results from an analysis of about 400 $K^{\pm} \to \pi^{\pm}\gamma\gamma$ rare decay candidates collected by the NA48/2 and NA62 experiments at CERN during low intensity runs with minimum bias trigger configurations are presented. The results include a model-independent decay rate measurement and fits to Chiral Perturbation Theory (ChPT) description. The data support the ChPT prediction for a cusp in the di-photon invariant mass spectrum at the two pion threshold. The NA48/2 Collaboration at CERN has accumulated unprecedented statistics of rare kaon decays in the Ke4 modes Ke4(+-) to $\pi^{+}\pi^{-}e\nu$ and Ke4(00) to $\pi^{0}\pi^{0}e\nu$ with ˜one percent background contamination. The detailed study of form factors is sensitive to small isospin symmetry breaking effects. This brings new inputs to low energy QCD description and crucial tests of predictions from Chiral Perturbation Theory and lattice QCD calculations.

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