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Long-distance contributions to the rare kaon decay K+ -> pi+ l+ l-

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The rare decays of a kaon into a pion and a charged lepton/antilepton pair proceed via a flavour changing neutral current and therefore may only be induced beyond tree level in the Standard Model. This natural suppression makes these decays sensitive to the effects of potential New Physics. To discern such New Physics one must be able to control the errors on the Standard Model prediction of the decay amplitude. These particular decay channels however are dominated by a single photon exchange; this involves a sizeable long-distance hadronic contribution which represents the current major source of theoretical uncertainty. In this talk I will outline our methodology for the computation of the long distance contributions to these rare decay amplitudes using lattice QCD, and present the numerical results of some exploratory studies using the Domain Wall Fermion ensembles of the RBC and UKQCD collaborations.

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