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Structure-dependent electromagnetic finite-size effects on the lattice (17+3)

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The systematic effect associated to the finite-volume constraint in lattice calculations has to be corrected for in order to make physical predictions and from these precision tests of the Standard Model. For (sub-)per cent precision one has to include also electromagnetic effects on the lattice, which can lead to particularly large finite-size effects. The finite-size scaling depends not only on properties such as particle masses, but also on structure-dependent form-factors. Examples of the latter are the electromagnetic charge radii of pions and kaons. In this talk we present how to analytically derive these electromagnetic finite-size effects in a relativistic, model-independent and systematic approach, with particular focus on leptonic decays of pions and kaons. The finite-size scaling in leptonic decays allows for improved numerical control in extractions of light-quark CKM-matrix elements from lattice simulations.

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