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Electromagnetic corrections to the leptonic decay rates of charged pseudoscalar mesons: lattice results

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Electromagnetic effects on the leptonic decay rates $\pi^+ \rightarrow \mu^+ \nu$ and $K^+ \rightarrow \mu^+ \nu$ are evaluated for the first time on the lattice.

Following a method recently proposed in Ref. [1] the emission of virtual photons at leading order in the e.m. coupling is evaluated on the lattice with the subtraction of the infrared divergence computed for a point-like meson at finite lattice volume.

The physical decay rate is then obtained by adding the emission of real photons regularized with a photon mass.

Using the gauge ensembles produced by ETMC with $N_f=2+1+1$ dynamical quarks the feasibility of the lattice approach is demonstrated and preliminary results for the decay rates of charged pion and kaon will be presented.

[1]. N. Carrasco et al., Phys. Rev. D91 (2015) 074506.

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