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Vus and lepton universality from kaon decays at KLOE

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KLOE has measured most decay branching ratios of K_S, K_L amd Kˆ+- mesons.
It has also measured the K_L and the Kˆ+- lifetime and determined the shape
of the form factors involved in kaon semileptonic decays.
We present a description of the above measurements and a well organized
compendium of all of our data, with particular attention to correlations.
These data provide the basis for the determination of the CKM parameter
V_us and a test of the unitary of the quark flavor mixing matrix.
We also test the lepton universality in Kl3 decays and place bounds
on new physics using measurements of V_us from Kl2 and Kl3 decays.
All of the above measurements, together with the results on KS, KL and K+-
decays published during 2006 and 2007 have recently combined in
JHEP 04 (2008) 059, to obtain the KLOE determination of Vus.

A measurement of the ratio R_K=Gamma(Ke2)/Gamma(Kmu2) with 1.3% accuracy
has also been performed. The result is based on 2.2 fb-1 of data collected
at the Frascati e+e- collider DAFNE. Recently, it has been pointed out that in a supersymmetric
framework, lepton flavor changing processes mediated by the charged Higgs
could occur, in particular in the kaon decay to an electron and tau
neutrino. In this scenario, deviations of up to few percent on R_K from SM
expectation are quite possible. The measurement will be described, and its
theoretical implications will be discussed.

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