

KLOE measurements of the charged Kaon lifetime and BR(K⁺ into pi⁺ pi⁰)

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The charged K lifetime, is an experimental input to the determination of V_{us} . The present fractional uncertainty is about 0.2%, however the available data show large discrepancies between the measurements done using charged kaon decays in-flight and at-rest. At KLOE two different methods have been developed: one based on the measurement of the charged kaon decay length and the other based on its decay time. Both methods allow us to reach accuracies at the few per mil level. These two independent methods allow us to assess part of the systematic uncertainty. Efficiency and resolution functions are measured directly on data using an independent control sample. The measurement of the charged kaon lifetime will be presented.

A new precise measurement of the absolute BR(K⁺ -> pi pi⁰ (gamma)) has an important impact on the world average of the charged kaon semileptonic BR's, because of the NA48, ISTRA+ and E865 experiments that use the pi pi⁰ decay in the normalization sample. A pure K⁺ beam is tagged at KLOE by the reconstruction of the K⁻ -> mu nu decays. The signal counting is given by a fit to the distribution of the momentum of the charged decay particle in the kaon rest frame assuming the pion mass. The shapes of the signal and of the background (mu nu and 3 bodies decays) are obtained from data control samples and MC. Efficiency is measured directly on data using an independent control sample. The measurement of the BR(K⁺ -> pi pi⁰ (gamma)) will be presented.

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