Flavour Physics: Week: VIII

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Problem 1. The KLOE detector uses e^+e^- collisions to produce ϕ (1020) resonances that will later decay into K^+K^-. One of the KLOE's analyses studied the K^+ decay to $\mu^+\nu_\mu$ (seen during the lectures).

(a) Search in the PDG the branching ratio of the decay $\phi \to K^+K^-$. Considering the result, is this a good way to study kaon decays

(b) Compute the modulus of the momenta of the produced kaons in the ϕ reference frame.

(c) Compute the modulus of the momenta of the produced μ^+ in the K^+ reference frame for the decay $K^+ \to \mu^+\nu_\mu$ (assume massless neutrinos).
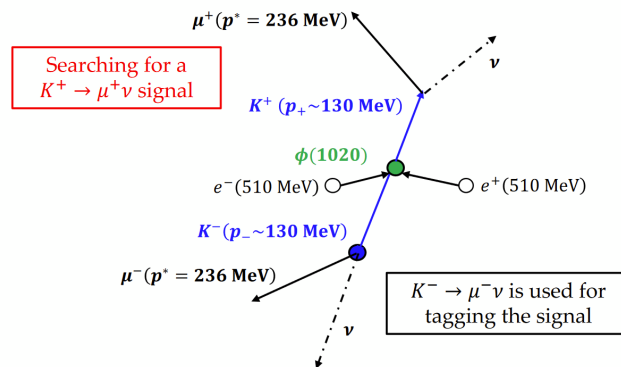

Figure 1: Sketch of the decay chain $\phi \to K^+K^-$ and $K^+ \to \mu^+\nu_\mu$ at the KLOE detector.