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## Revisiting the charged kaon mass

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The precision of the charged kaon mass is much worse, an order of magnitude, than the precision of the charged pion mass. Beside the interest in its intrinsic value, the uncertainty in the kaon mass has large influence on the K-N scattering lengths and through them on the kaon-nucleon sigma terms, which reflect the degree of chiral symmetry breaking.

Nowadays, the charged kaon mass can be most precisely determined in the measurements of X-ray transitions in kaonic atoms. The current value,  $m_K=493.677\pm 0.013$  MeV, has been obtained as a weighted average of the six measurements, which have very different uncertainties, ranging from 7 keV up to 54 keV. Two most recent and precise measurements, which largely determine the above value, differ by 60 keV and have uncertainty of approximately 10 keV.

To resolve this discrepancy a new measurement is highly desirable, and it would be sufficient that it has the same precision as the two above mentioned measurements to substantially enhance the precision of the kaon mass.

We plan to determine the charged kaon mass with the requested precision in measurements of X-ray transitions in kaonic atoms of selected solid targets with two HPGe detectors at DAPHNE in Frascati, Italy, initially in parallel with SIDDHARTA-2 measurements of X-ray transitions in gaseous targets, and, if necessary, as a dedicated measurement.

Since DAPHNE is producing kaon pairs of low momenta, contrary to the previous measurements, there is no need for a degrader at all or only a thin degrader to slow down kaons and there are no secondary particles in the beam, which is certainly an advantage. But we expect high bremsstrahlung close to the interaction point and also background originating from the kaons absorbed by nuclei. The latter is being determined by using GEANT4 simulations and to determine the beam background measurements in the hall are necessary, and indeed this background will dictate the performance of this measurement. The status of the preparations of the measurement will be presented.

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