

# $V_{ud}$ from mirror transitions and experiments with atom and ion traps

NAVILIAT-CUNCIC OSCAR

*National Superconducting Laboratory and Department of Physics and Astronomy,  
Michigan State University - East-Lansing, MI, USA*

The  $V_{ud}$  element of the Cabibbo-Kobayashi-Maskawa quark mixing matrix fixes the strength of the weak interaction in semi-leptonic processes involving the  $u$  and  $d$  quarks. A new set of nuclear transitions has been considered recently to extend the possible sources for the determination of  $V_{ud}$ . These are super-allowed  $\beta$  transitions between  $T=1/2$  isospin doublets in mirror nuclei, which are driven by both, the vector and the axial-vector components of the weak interaction. The extraction of  $V_{ud}$  requires, in addition to the determination of the  $Ft$ -value, the measurement of an additional correlation coefficient in those mirror decays. Several such measurements have been recently carried out using atom and ion traps.

In this presentation I will review the status of the extraction of  $V_{ud}$  from nuclear mirror transitions and discuss recent results in the measurements of spectroscopic quantities as well as future prospects for the determination of correlation coefficients.