

## Search for weak dipole moments of the $\tau$ lepton with the ALEPH detector

The weak dipole moments of the tau lepton are expected to be zero within the SM prediction, except for quantum corrections. We explore here possible deviations for the real and imaginary components of both the weak magnetic and the CP-violating weak electric dipole moments, i.e.  $\Re(\mu_\tau)$ ,  $\Im(\mu_\tau)$ ,  $\Re(d_\tau)$  and  $\Im(d_\tau)$ . ALEPH already published results on  $\Re(d_\tau)$ . However, the other terms are determined here for the first time. We use  $155 \text{ pb}^{-1}$  of data taken by the ALEPH detector from 1990 to 1995. The four terms are extracted simultaneously by a likelihood fit built from the full differential cross section. The tau polarisation vectors are recovered with polarimeters differing for each decay topology. No signs of new physics have been found and we set the following bounds at 95% CL:  $|\Re(\mu_\tau)| < 1.34 \times 10^{-3}$ ,  $|\Im(\mu_\tau)| < 2.02 \times 10^{-3}$ ,  $|\Re(d_\tau)| < 4.62 \times 10^{-18} \text{ e cm}$ , and  $|\Im(d_\tau)| < 8.29 \times 10^{-18} \text{ e cm}$ .