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## D MESONS

Revised January 2000 by P.R. Burchat (Stanford University).

The new experimental results on  $D$  mesons reported in this edition are mostly from the CLEO-II experiment at the CESR  $e^+e^-$  storage ring and from the fixed-target experiment E791 at Fermilab. The CLEO experiment has measured the  $D^+$ ,  $D^0$ , and  $D_s^+$  lifetimes, and E791 has measured the  $D^0$  and  $D_s^+$  lifetimes. The measured ratio of  $D_s^+$  to  $D^0$  lifetimes is now significantly greater than unity:  $\tau(D_s^+)/\tau(D^0) = 1.20 \pm 0.02$ .

The E791 experiment has obtained the first directly measured limit on the decay-width difference  $\Delta\Gamma$  for the mass eigenstates of the neutral  $D$  system, looking for a difference in decay rates between the  $CP$ -even decay  $D^0 \rightarrow K^+K^-$  and the  $CP$ -mixed decay  $D^0 \rightarrow K^-\pi^+$ . The CERN experiment ALEPH and CLEO have made new searches for neutral  $D$  mixing in the “wrong-sign” decay  $D^0 \rightarrow K^+\pi^-$ ; no evidence for mixing has been found. CLEO has reduced the uncertainty on the measurement of the doubly Cabibbo-suppressed decay rate  $\Gamma(D^0 \rightarrow K^+\pi^-)$  by about a factor of three.

The CERN experiment BEATRICE has measured form factors for the semileptonic decay  $D^+ \rightarrow \overline{K}^*(892)^0\ell^+\nu_\ell$ , and E791 has measured form factors both for this decay and for  $D_s^+ \rightarrow \phi\ell^+\nu_\ell$ . The CERN experiment OPAL has measured the semileptonic branching fraction for charm hadrons produced in  $Z \rightarrow c\bar{c}$ . The Fermilab experiment CDF has set limits on semileptonic decay rates involving  $K$  resonances above the  $K^*(892)$ . The BEPC experiment BES has observed one  $D^+ \rightarrow \mu^+\nu_\mu$  event, and CLEO has improved a measurement of the  $D_s^+$  leptonic decay constant.

CLEO has now measured the important  $D^0 \rightarrow K^-\pi^+$  branching fraction using three different methods, and has also measured  $D^+$  and  $D_s^+$  branching fractions involving  $\eta$  and  $\eta'$  mesons. An E791 search for 24 rare or forbidden decays to dilepton final states yielded no evidence for new physics.