EUROPEAN ORGANIZATION FOR PARTICLE PHYSICS

CERN-PPE/94-90
13 June 1994

Measurement of the Time Dependence of $B^0_d \leftrightarrow \bar{B}^0_d$ Mixing using Leptons and $D^{*\pm}$ Mesons

The OPAL Collaboration

Abstract

Data collected with the OPAL detector at LEP during 1990–1993 are used to measure the time dependence of $B^0_d \leftrightarrow \bar{B}^0_d$ mixing. From a sample of 153 ± 12 events with a charged D^* and a lepton in the opposite hemisphere, we measure the $B^0_d \leftrightarrow \bar{B}^0_d$ oscillation frequency to be

$$\Delta m_d = 0.57 \pm 0.11(\mathrm{stat.}) \pm 0.02(\mathrm{syst.})\ \mathrm{ps}^{-1}.$$

This corresponds to an oscillation parameter of $x_d = \Delta m_d \tau_{B^0_d} = 0.82 \pm 0.16(\mathrm{stat.}) \pm 0.03(\mathrm{syst.}) \pm 0.09(\mathrm{syst.}\ \tau_{B^0_d})$, where the second systematic uncertainty is due to the error in the measured B^0_d lifetime.

(To be submitted to Physics Letters B)