



Contribution ID: 734

Type: Poster

## Final Results on the Rare Decay $KL \rightarrow \pi^0 \nu \bar{\nu}$ from the KEK E391a Experiment

The neutral-kaon decay  $KL \rightarrow \pi^0 \nu \bar{\nu}$  is a direct CP-violating process caused by a flavor-changing neutral current, and the branching ratio is predicted to be  $(2.49 \pm 0.39) \times 10^{-11}$  in the Standard Model. The rare decay is one of the processes expected to have a significant impact on new physics searches. The E391a experiment at the KEK 12-GeV proton synchrotron was the first dedicated search for  $KL \rightarrow \pi^0 \nu \bar{\nu}$ . The final results, which have just been published in Phys.Rev.D81, 072004 (2010), are reported in this contribution. Combining the data sets in February-April 2005 (Run-2) and October-December 2005 (Run-3), the single event sensitivity was  $1.11 \times 10^{-8}$  and no events were observed in the signal region. The upper limit on the branching ratio was set to be  $2.6 \times 10^{-8}$  at the 90% confidence level. The E391a experiment as a whole has improved the limit from the experiments (FNAL-KTeV, ...) by a factor of 20.

**Primary author:** Prof. KOMATSUBARA, Takeshi (KEK)

**Presenter:** WATANABE, Hiroaki (KEK)

**Track Classification:** 06 - CP violation, CKM and Rare Decays