

The E246 experiment is searching for T-violating transverse muon polarization in charged kaon decay  $K^+ \rightarrow \pi^0 \pi^+ \pi^0$  using the superconducting toroidal spectrometer at the K5 channel. In 2000 new data were obtained increasing the total statistics by 25%. The data analysis was continued for the data taken in 1998. The data quality was found as good as the previous 1996-97 data. The two independent analysis method was followed and the combined result is still consistent with no T violation with the statistical accuracy of  $\text{Im}F_2 = 0.0175$ . Systematic errors was evaluated as small as in the previous 1996-97 data and about one sixth of the statistical one. The data from 1999 and 2000 have still to be processed. There are several byproduct physics which can be analyzed. The form factors of the  $K^+ \rightarrow \pi^0 e^+ \pi^0$  decay were obtained showing no evidence for tensor and scalar couplings in contradiction to the current world average values.

#### Figure caption

Positron time spectrum from  $K_{\pi^0}$  muon decays is shown for the 1998 data in the E246 experiment. From the clockwise and counter-clockwise asymmetry of the positron rate, the muon transverse polarization which is the sign of T violation can be detected.

