

The experiment is searching for T-violating muon polarization ( $P_T$ ) in the  $K^+ \rightarrow \pi^0 \pi^+ \pi^0$  ( $K_{\pi^3}$ ) decay. After the completion of data acquisition in 2000, the group was continuing analysis of data taken in 1999 and 2000. In order to ensure the reliability of results and to estimate the systematic errors associated with analysis, two-independent-analysis method was employed. One of them has been finished and its result was reported to an international conference (PANIC02); it is  $P_T = (-1.12 \pm 2.17 \text{ (stat)} \pm 0.90 \text{ (syst)}) \times 10^{-3}$  when combined with the previous results of 1996 to 1998, and consistent with zero. The final result will be obtained by combining it with the result of the second analysis which is now being completed. Similar transverse polarization was analyzed in the decay of  $K^+ \rightarrow \pi^+ \pi^0 \pi^0$  ( $K_{\pi^2\pi}$ ) using the data of 1996-1998 as a byproduct. This polarization is as sensitive as the  $K_{\pi^3}$  polarization to new sources of CP violation in the Higgs sector. A result of  $P_T = (-0.57 \pm 1.85 \text{ (stat)} \pm 0.10 \text{ (syst)}) \times 10^{-2}$  was obtained as the first measurement of  $P_T$  in this channel.

In E470 the decay of  $K^+ \rightarrow \pi^+ \pi^0 \pi^0$  ( $K_{\pi^2\pi}$ ) was studied to determine the direct photon emission branching ratio using the E246 setup with a slight modification. This component is thought to be mainly a chiral-anomaly magnetic transition and important to compare it with the chiral perturbation theory. Up to now there was a contradictory situation among experimental data. The E470 data taken in 2001 was analyzed and the direct emission component was extracted as a deviation of spectra from the inner bremsstrahlung ones to have the branching ratio of  $(6.1 \pm 2.5 \text{ (stat)} \pm 1.9 \text{ (syst)}) \times 10^{-6}$  which is consistent with the previous result from a stopped  $K^+$  decay experiment.