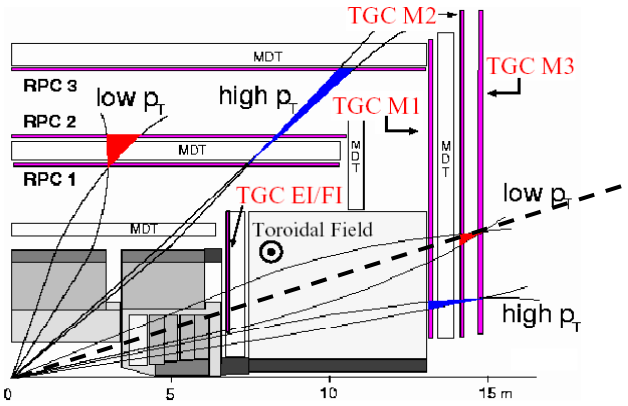
アトラス端部ミューオントリガー系：ATLAS Endcap Muon Trigger System



ATLAS TGC Collaboration of Japan, Israel and China

Specifications

TGC : anode wire diameter 50μm, gas gap 2.8mm, wire pitch 1.8mm, gas CO_2+n-pentane, gas gain=10^6, wire (r) and cathode (phi) readout, cathode resistivity =1MΩ/sq,

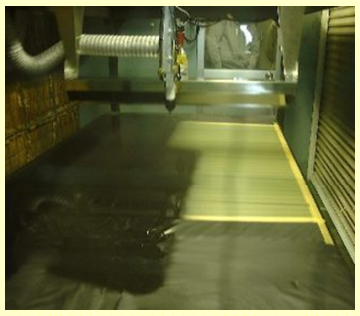
Chambers: T1(144), T2(192), T3(288), T4(192), T5(192), T6(672), T7(672), T8(672), T9(384), T10(96), T11(84), total number of chambers 3588

Readout: 230,784 (wire), 100,992 (cathode), total 331,776 channels

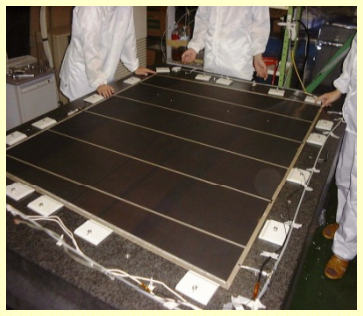
Trigger: 1st level, $1.05<|\eta|<2.4$, trigger rate:13.2kHz(P_t>6GeV@10^{33}), 2.8KHz(P_t>20GeV@10^{34})

Radiation level: worst case 10^{11} neutrons/cm^2/yr, 0.62 Gy/yr

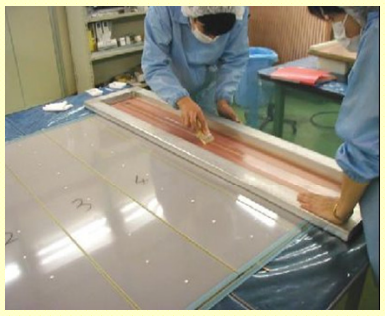
Production of 1200 Thin Gap Chambers (TGC) at KEK



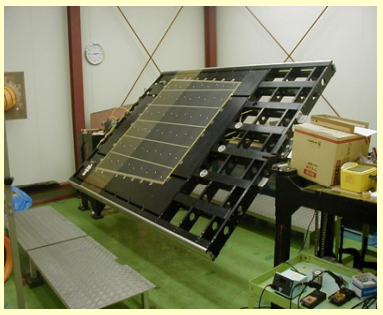
Automatic carbon spray



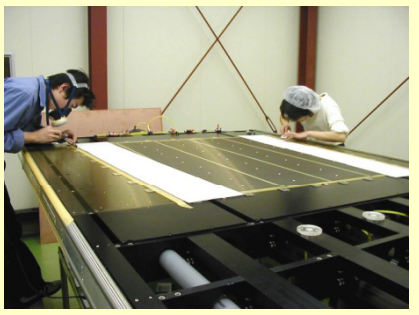
Inspection and measurement



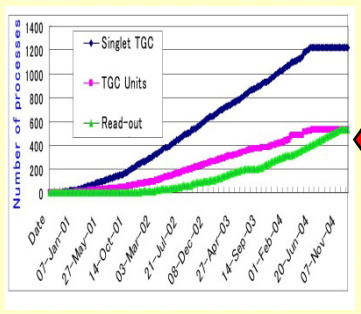
Applying epoxy for gluing



Automatic wire winding



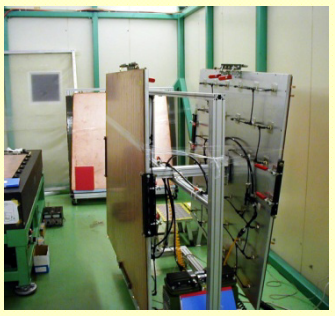
Soldering wires and washing



1200 chambers were Assembled in 4 years

Ready to shipping to Kobe Univ.

Triplets/doubles assembly, ATLAS inspection in Nov. 2001

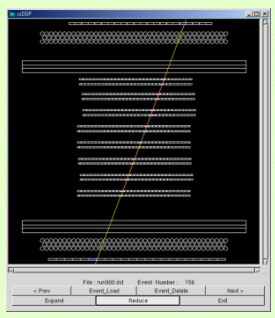


Epoxy sealing of chamber edges

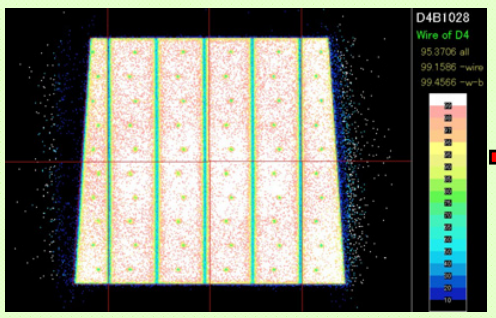
Inspection, cleaning, HV checking

TGC chamber inspection with cosmic-rays at Kobe University

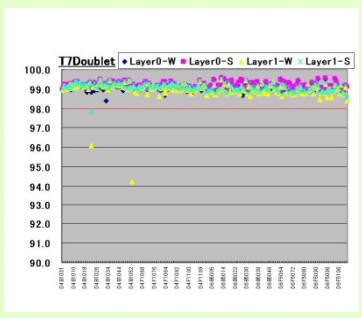
Cosmic-ray inspection stand at Kobe Univ.



Event display



Efficiency map of a T7 chamber

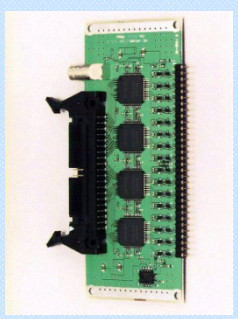


Efficiency plot of T7 doubles

Ready to ship to CERN. Each container is air-conditioned.

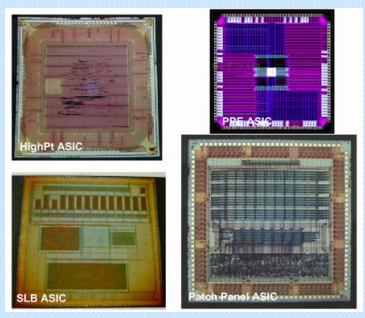
Via the Indian Ocean

Readout and Trigger system for TGC chambers

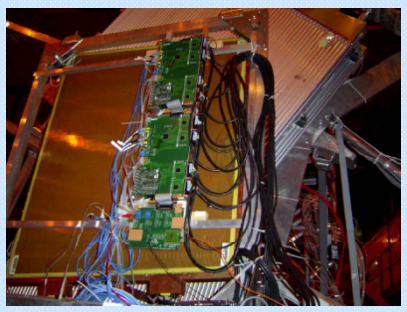


4-ch ASD chips with SONY bipolar tech.

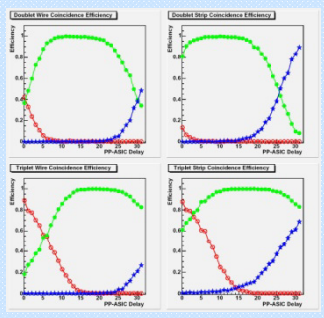
ASD board inspection in USTC China in 2000



4 ASICs designed by graduate students and manufactured

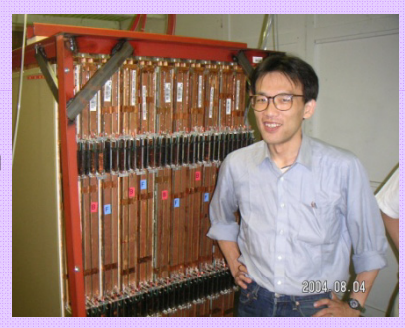


On-chamber test at CERN H8 beam in 2003 and 2004



Efficiency curves as a function of bunch timing

Installation into big wheels at CERN



Receiving/inspections at UA1

Fixing small leaks/final inspections

Mounting TGC chambers and Electronics on the Big-Wheel

Transportation of a big-wheel sector to the underground hall