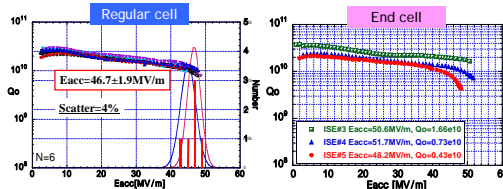




SRF2009 THPP0082

ICHIRO single cell cavities

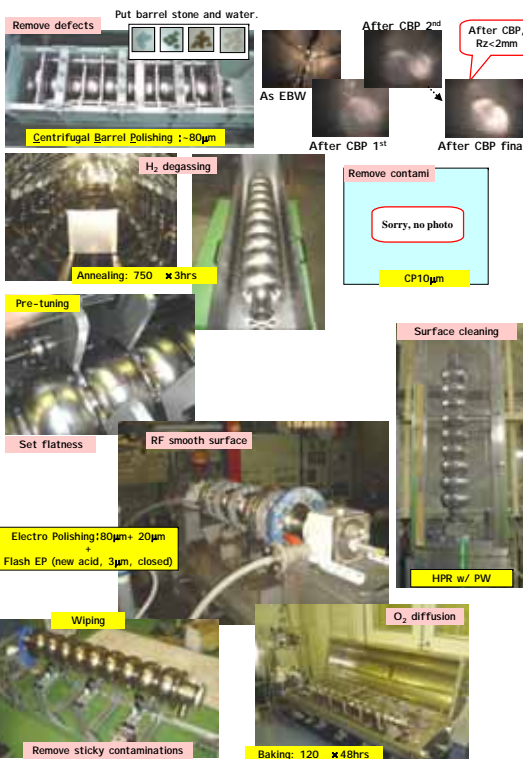


Current best recipe :

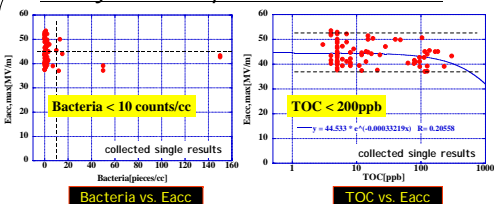
CBP+CP+AN+EP(80μm+20μm)+flash EP(3μm)
+Ethanol rinsing+Wiping+HPR+Bake

Not yet work well
on 9-cell!!

ICHIRO 9-cell preparation



Quality control of pure water at KEK-ARE2



At KEK-ARE2, we use pure water for HPR.

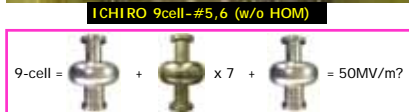
PW quality control is Okay for 40MV/m at ARE2.

50 tight loop study on ICHIRO 9-cell cavity #5

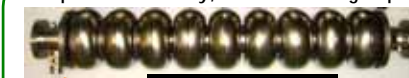
Fumio Furuta¹, Kenji Saito¹, Taro Konomi¹, ¹KEK
Rong-Li Geng², Curtis Crawford², ²J-lab.
Damon Bice³, ³Fermilab

New ICHIRO 9-cell cavities

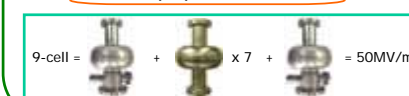
Step-1: straight beam tube, no end groups



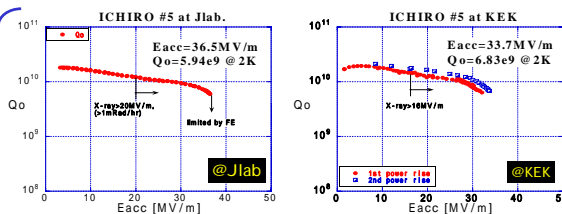
Step- : full cavity, with full end groups



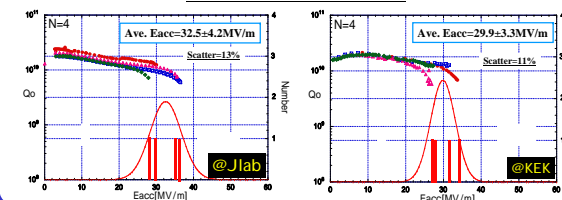
Under preparation for VT



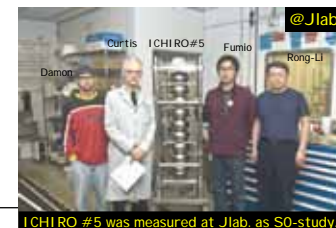
Current best results of ICHIRO



Statistics of VT results

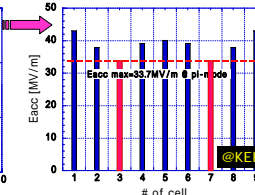


50 tight loop study was done on New ICHIRO 9-cell #5 at Jlab / KEK.
Surface treatments + VT were repeated.



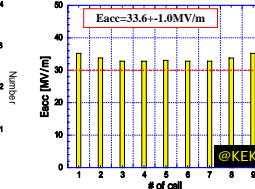
ICHIRO #5 was measured at Jlab. as 50-tight-loop study.

pass-band analysis



Pass-band measurements was consistent with pi-mode measurements.
3rd or 7th cell limited pi-mode gradient.

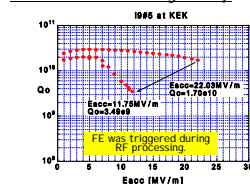
Statistics of pass-band analysis



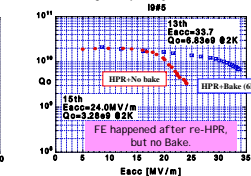
All cell achieved more than 30MV/m.
Our first target is achieve ave. Eacc of 35MV/m at pi-mode in statistics.

Puzzle of 9-cell cavities

Limitation at new tight loop



*Rinsing + VT were repeated on ICHIRO 9-cell #5 at KEK as new tight loop study.



Model chart of limitations

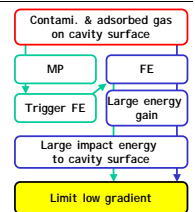


Table of puzzle's pieces

Subjects	Cause	Countermeasures	Results, status
EP	Sulphur contaminations	Degreasing, ethanol rinsing Understanding of sulphur generation at EP process	Understand of mechanism of Sulphur generation. No visible sulphur after EP.
PW (HPR)	Low quality imperfect control	Monitoring of TOC & Bacteria	No problem at single cell results.
Cavity cooling	Fast cool large ΔT>50K locally gas absorption MP/FE	Slow cooling Uniform cooling	ΔT<6K, kept 100K. Shorten processing time.
Field flatness	Special to multi cell	Re-pretuning after EP	96% okay, improved quality of data.
HPR time	Too short 4-6hrs?	Long time HPR (~10hrs)	Not yet get clear effect.
Evacuation speed	Contaminations by pumping turbulence	Slow evacuation	Need statistics. Seems okay but not clear.
HOM	Difficulty of rinsing, Multipacting	Wiping, ethanol rinse	Achieved 48MV/m w/ single cell cavity.
Closed VT w/ metal valve	Trigger Multipacting/Field emission	Set evacuation system to VT stand	VT on going w/ 1P(200L/s).
EBW	Accuracy of cup Conditions of EBW	CBP, inside EBW	Start test of EBW.

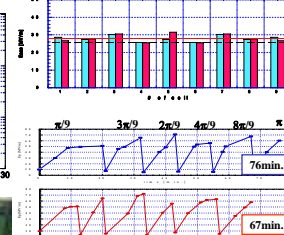
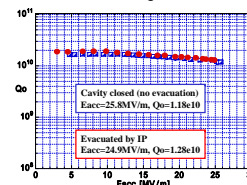
Understand, statistics okay

Need more statistics

Under testing

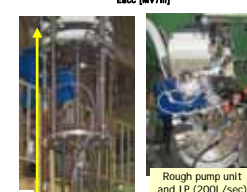
Recent challenging for 9-cell

Evacuation during VT



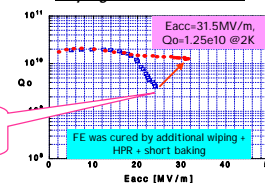
Pass-band analysis was almost same w/ and w/o evacuation.

Total process time was shorten by IP evacuation.



Rough pump unit and 1P (200L/sec)

Wiping effect on 9-cell



Wiping was effective to recover triggered FE, no damage on EP surface.

Summary

ICHIRO bare 9cell cavity achieved 36.5MV/m so far.

We are struggling with the puzzle "why best recipe for single cell cavity doesn't work on 9-cell?".

We consider sulphur contaminations and adsorbed gas on cavity surface were some hints of puzzle.

We trying to eliminate sulphur contaminations, and improve a vacuum of VT.

Wiping was effective to cure FE, seems no problem for EP surface.



9-cell VT stand