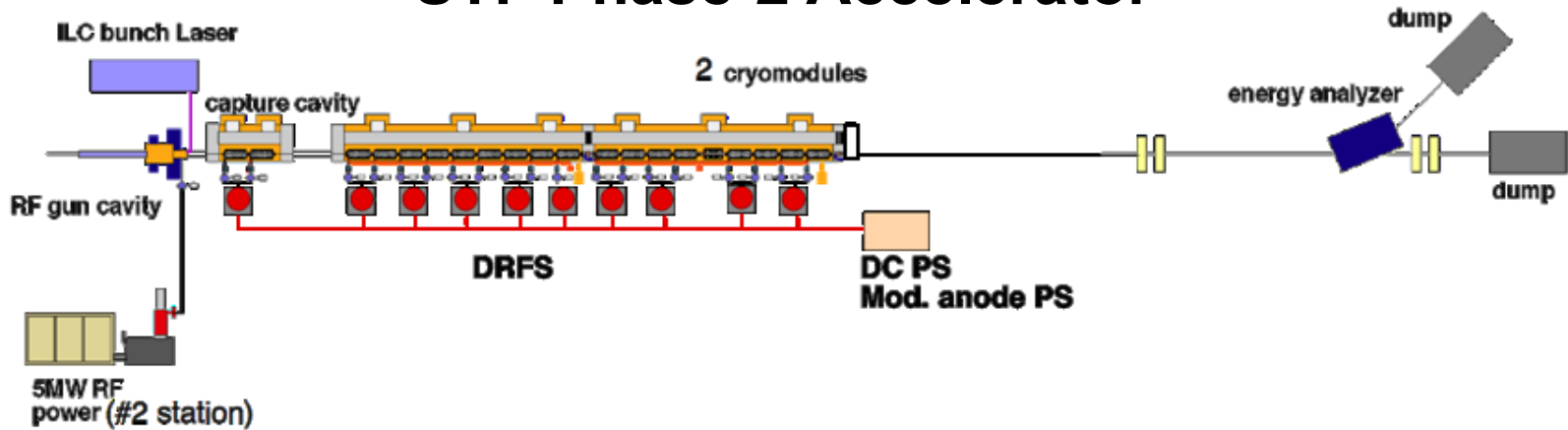


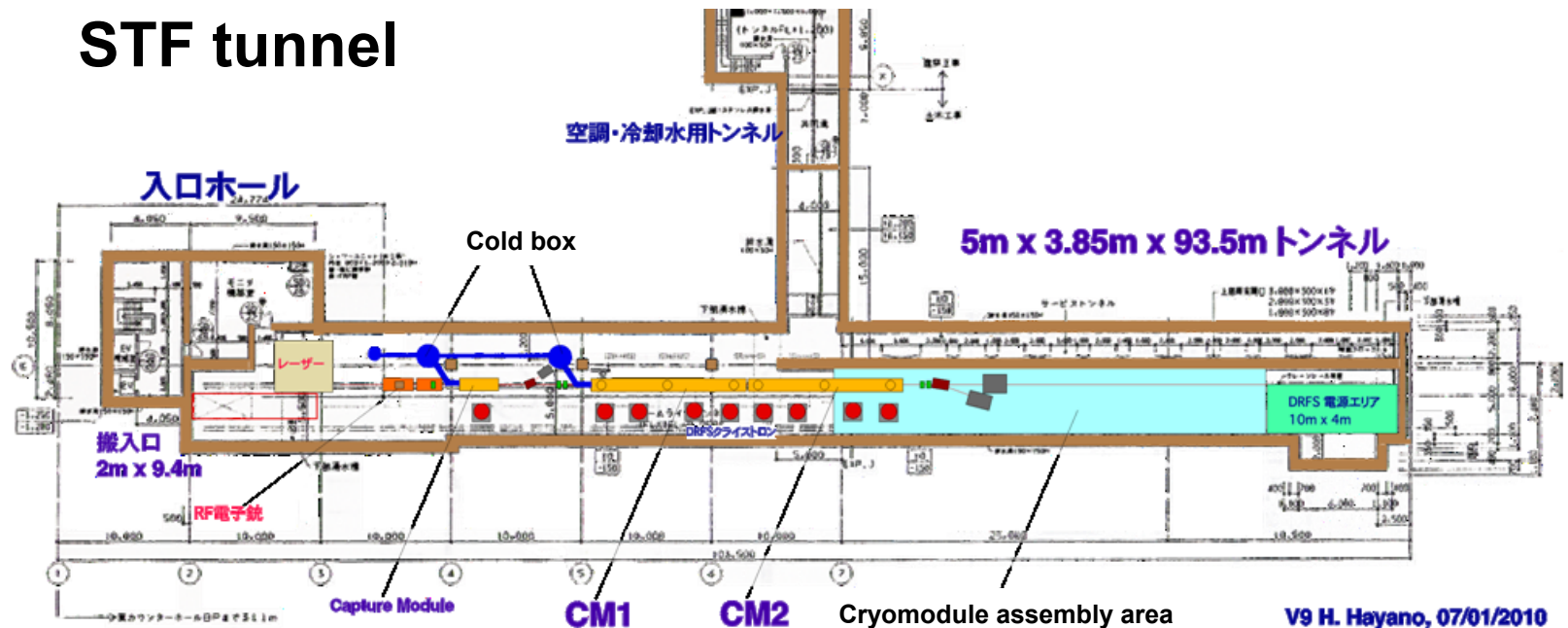
# **KEK cavity status, March 2011**

H. Hayano, 03202011

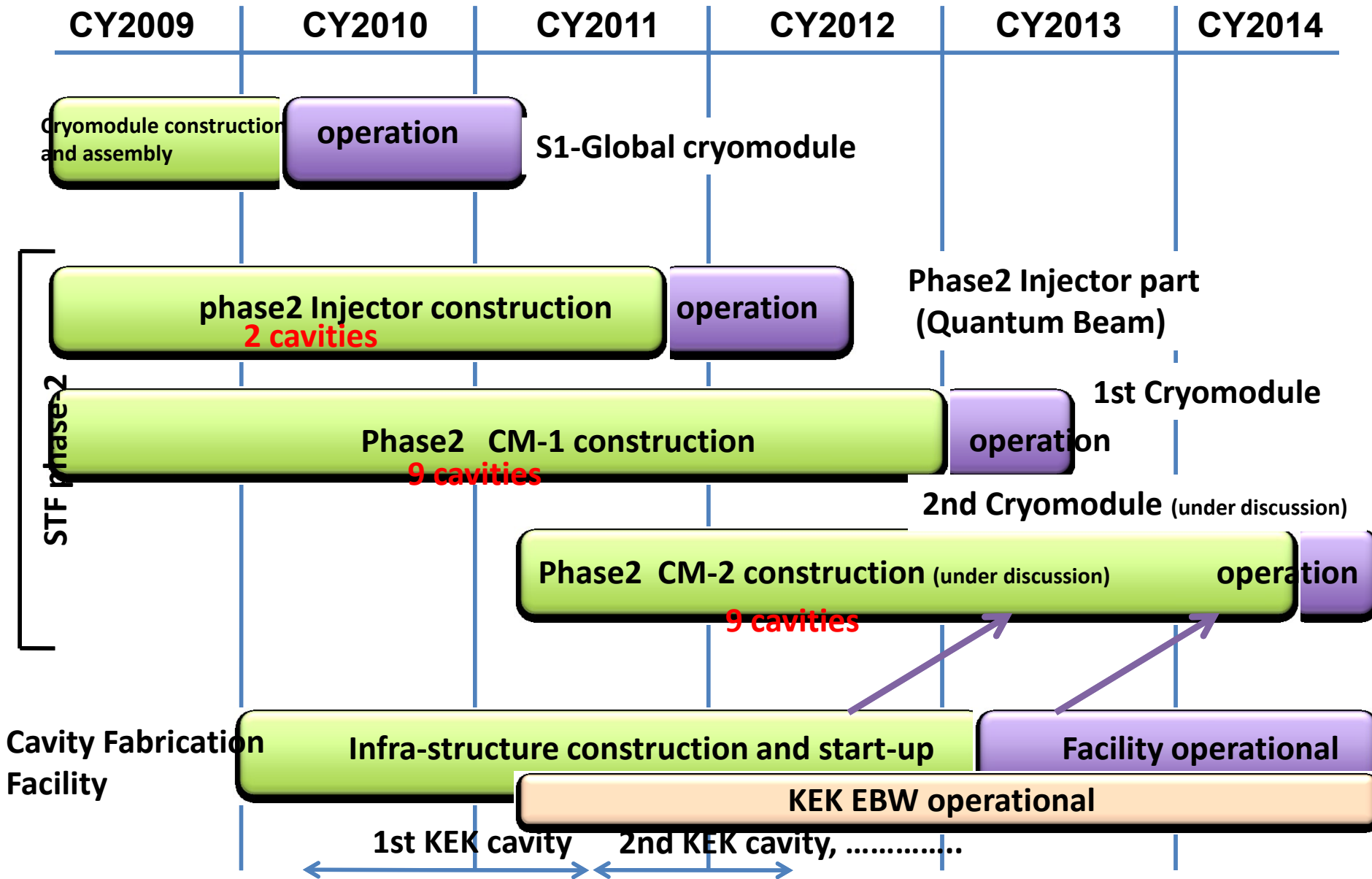
# STF Phase-2 Accelerator



## STF tunnel



# STF Plan (still under discussion)



# Cavity production plan in 2011

**Total 11 MHI cavities are planned. ( new production batch )**

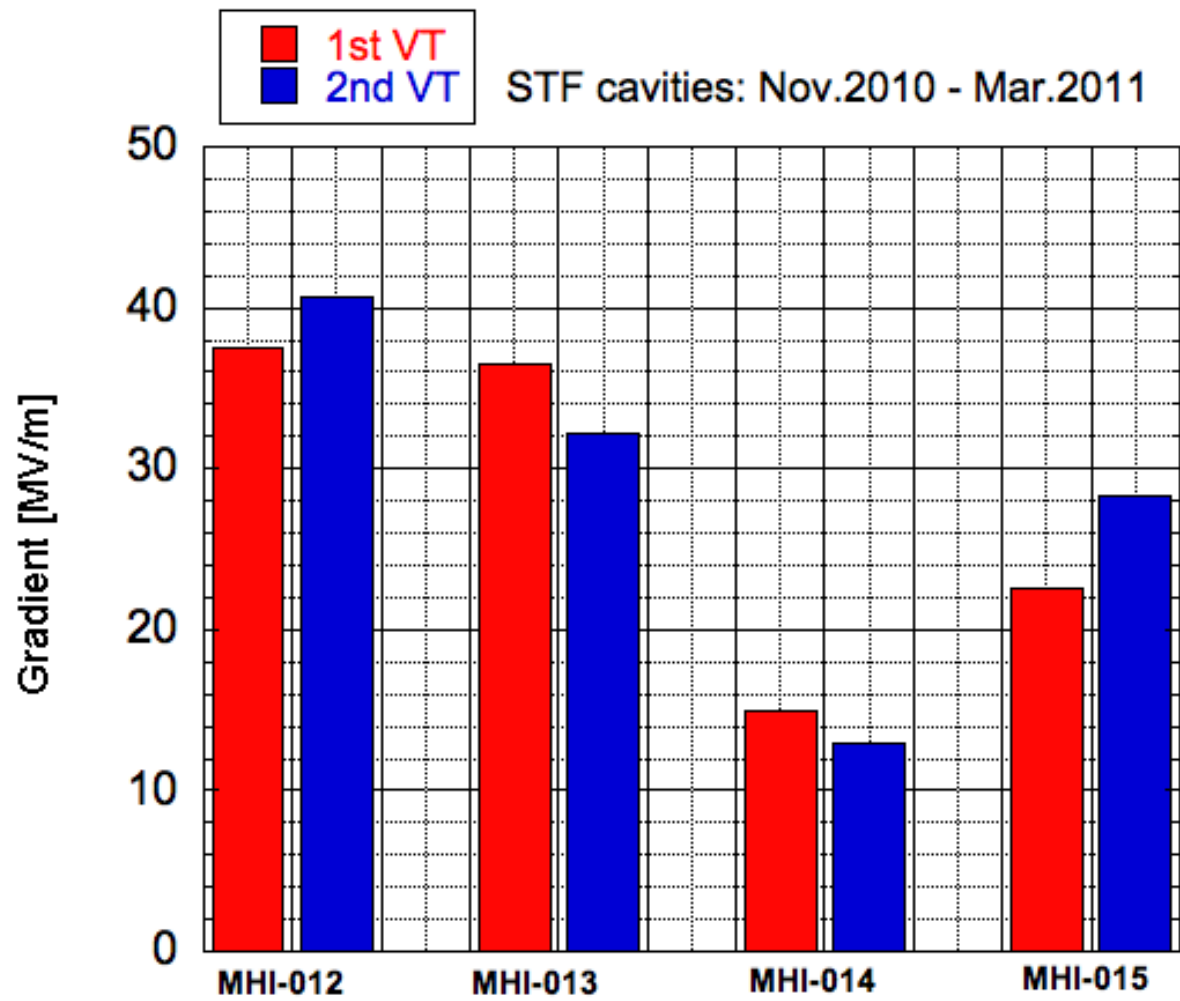
**For STF phase-2 Cryomodule**

**(1) MHI-012, MHI-013 : went to jacketing. will go to Capture Cryomodule.**

**(2) MHI-014, MHI-015, MHI-016, MHI-017 : under surface process and VT.  
They will finish in Oct. 2011.**

**(3) MHI-018, MHI-019, MHI-020, MHI-021, MHI-022  
: delivery in July 2011.  
Surface process and vertical test  
will finish in March 2012.**

\* These cavities are fabricated and inspected according to High-pressure-vessel code.



## MHI-012 ~ 015 ; Recent production 9 cell cavities for STF phase-2 cryomodules

MHI-012: 1<sup>st</sup> VT 37.5MV/m @ Q0=5.5E09 Nov 11,2010

MHI-012: 2<sup>nd</sup> VT 40.7MV/m @ Q0=6.2E09 Dec 08,2010

1 pit on cell #6 equator outside EBW seam

MHI-013: 1<sup>st</sup> VT 36.5MV/m @ Q0=7.5E09 Nov 25,2010,

MHI-013: 2<sup>nd</sup> VT 32.2MV/m @ Q0=8.8E09 Dec 22,2010,

3 pits on cell #2, #3, #5 equators  
outside EBW seam

Vacuum leak at beam-pipe flange during antenna assy.  
Helico-flex was exchanged.

MHI-014: 1<sup>st</sup> VT 15.0MV/m @ Q0=3.4E09 Jan 20,2011

MHI-014: 2<sup>nd</sup> VT 13.0MV/m @ Q0=4.1E09 Feb 17,2011

wide pits on Iris EBW seam between cell #8-#9 → Local grind in the next

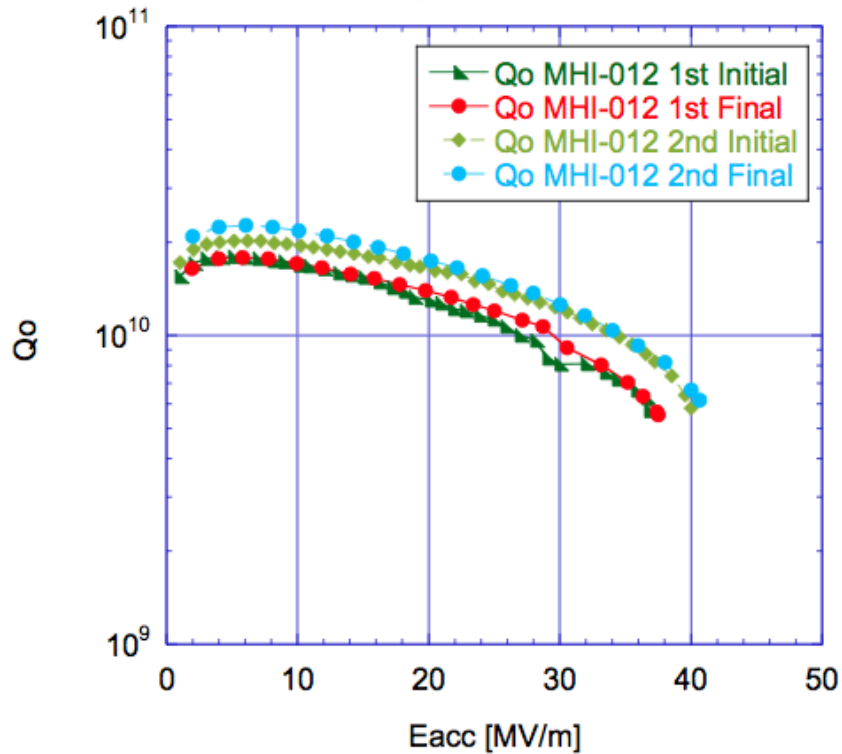
MHI-015: 1<sup>st</sup> VT 22.5MV/m @ Q0=1.0E10 Feb 03,2011,

1 pit on cell #2 equator EBW seam → Local grind was done.

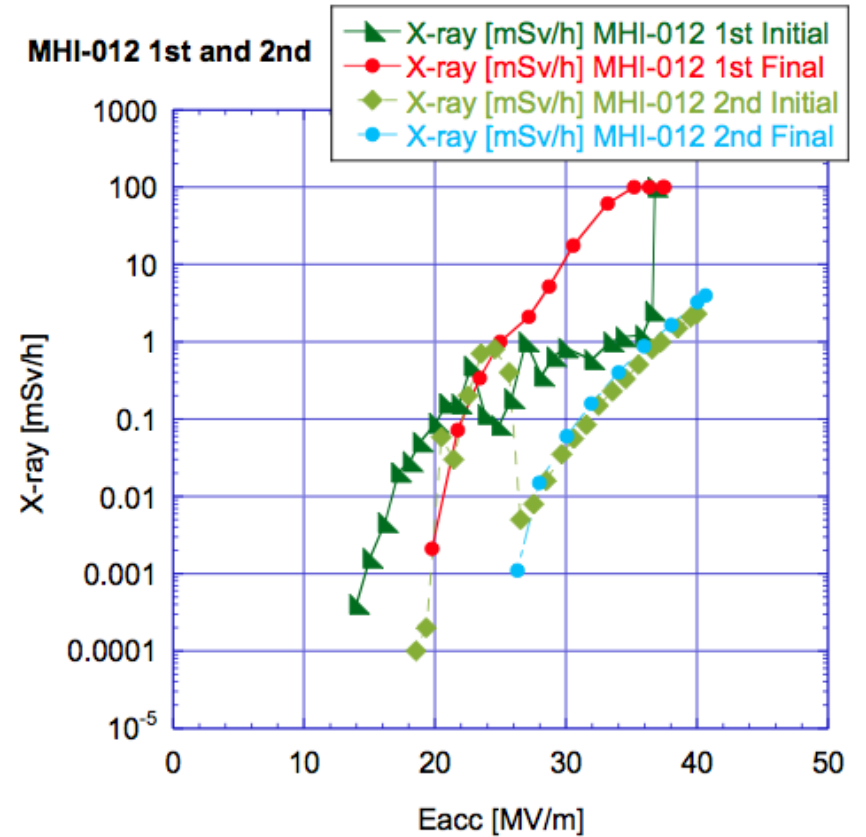
MHI-015: 2<sup>nd</sup> VT 28.3MV/m @ Q0=1.1E10 Mar 03,2011,

# MHI-012 Eacc, X-ray

MHI-012 1st and 2nd

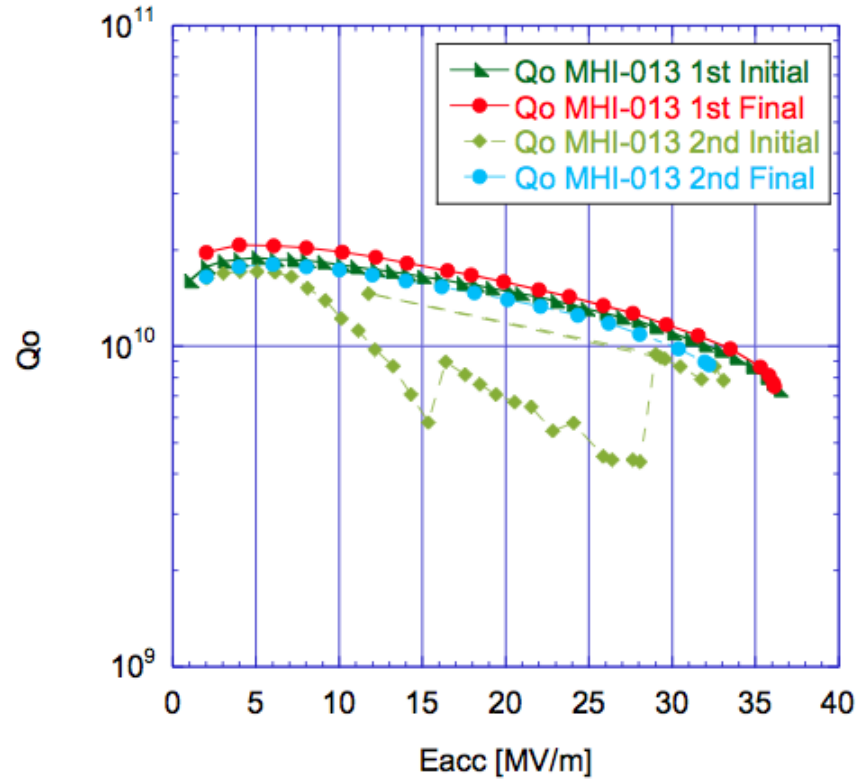


MHI-012 1st and 2nd

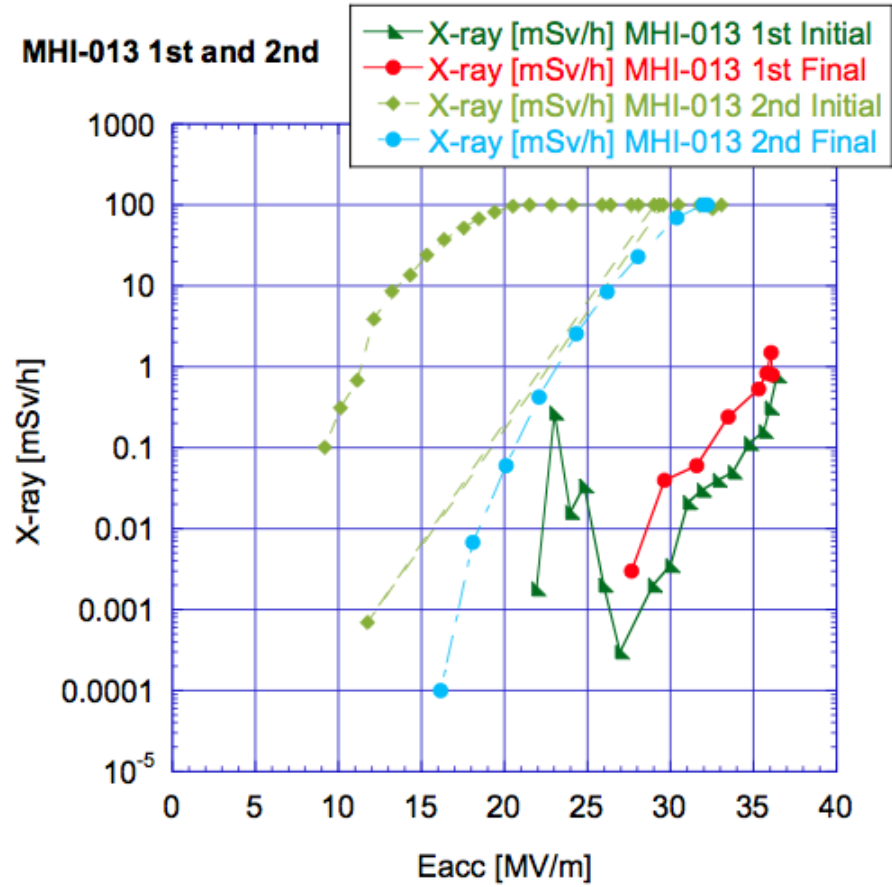


# MHI-013 Eacc, X-ray

### MHI-013 1st and 2nd



### MHI-013 1st and 2nd

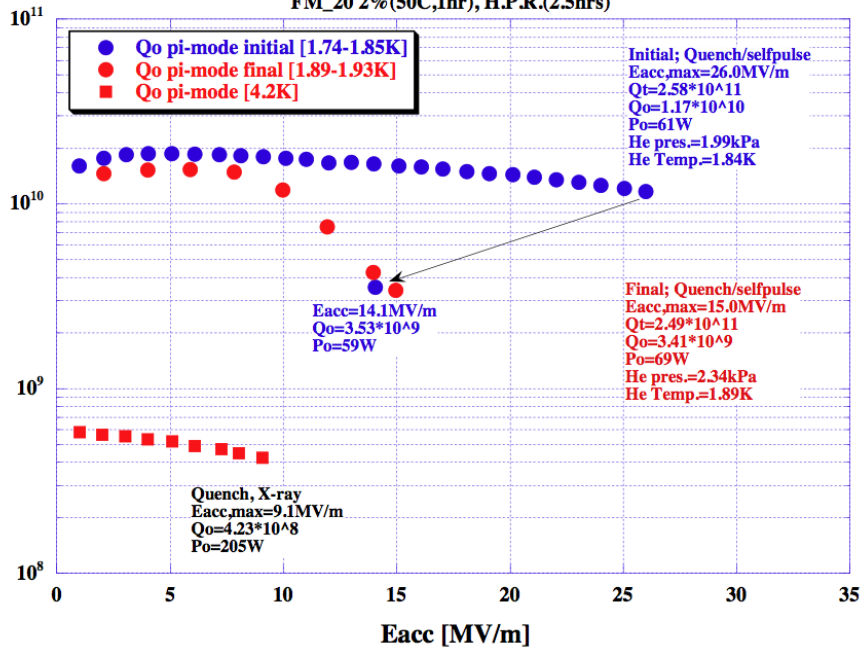




# MHI-014

## 1st VT

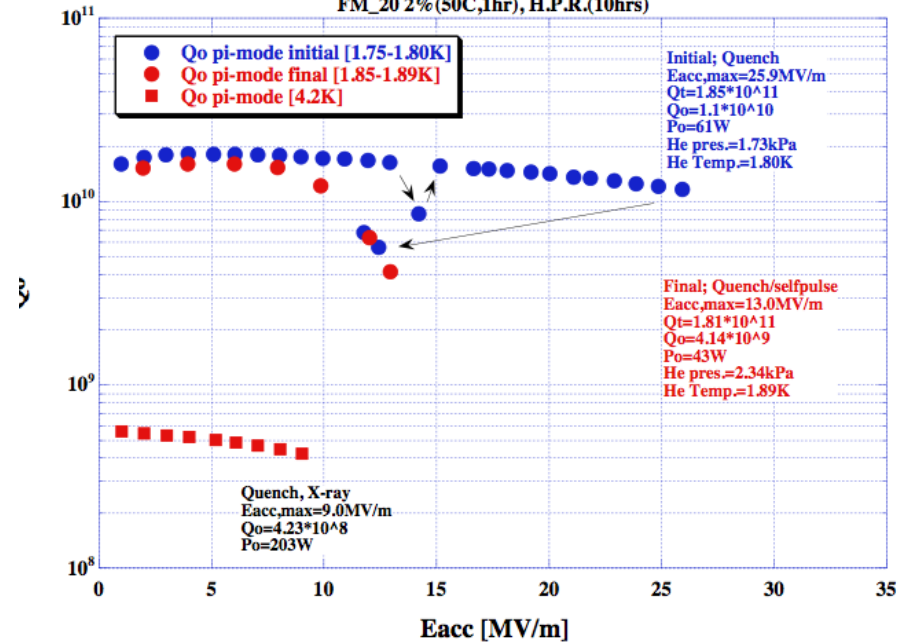
MHI No.14 1st. Vertical Test 01/20/2011  
 EP-II(~37mA/cm<sup>2</sup>, 20μm), Improved Water flow(1.5hrs),  
 FM\_20 2%(50C,2hrs), H.P.R.(~9hrs), Vacuum Leak&Re-Assembly,  
 FM\_20 2%(50C,1hr), H.P.R.(2.5hrs)



Field emission turned on,  
 Heating at cell#8 120 degree,  
 X-ray onset = 5 MV/m

## 2nd VT

MHI No.14 2nd. Vertical Test 02/17/2011  
 EP-II(~37mA/cm<sup>2</sup>, 20μm), Improved Water flow(1.5hrs),  
 FM\_20 2%(50C,1hr), H.P.R.(10hrs)



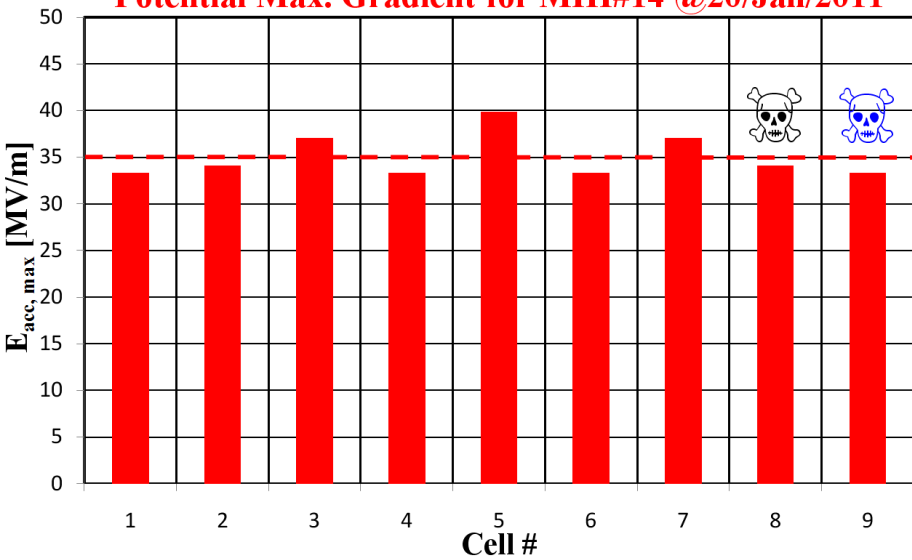
Field emission turned on,  
 Heating at cell#8 90 degree,  
 X-ray onset = 5 MV/m

# MHI-014

## Pass-band mode excitation

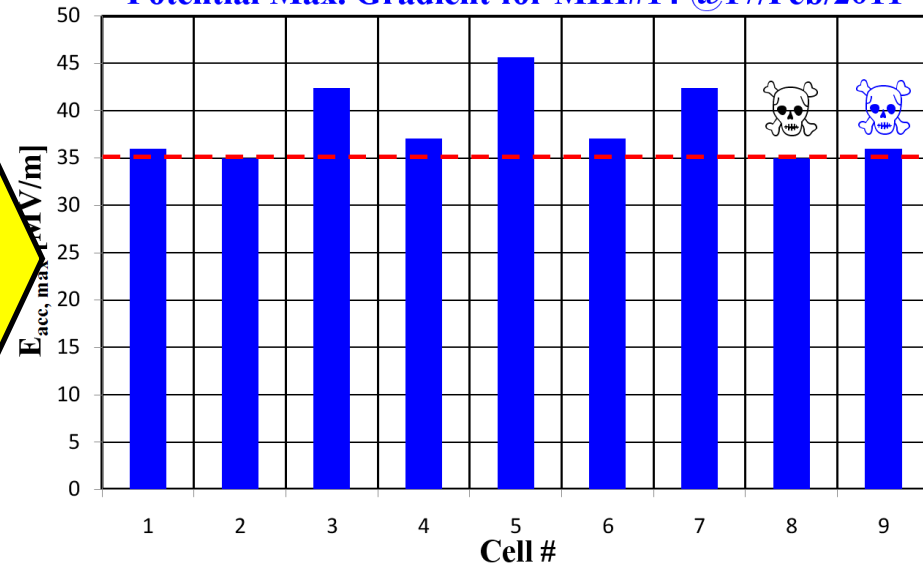
1st VT

Potential Max. Gradient for MHI#14 @20/Jan/2011



2nd VT

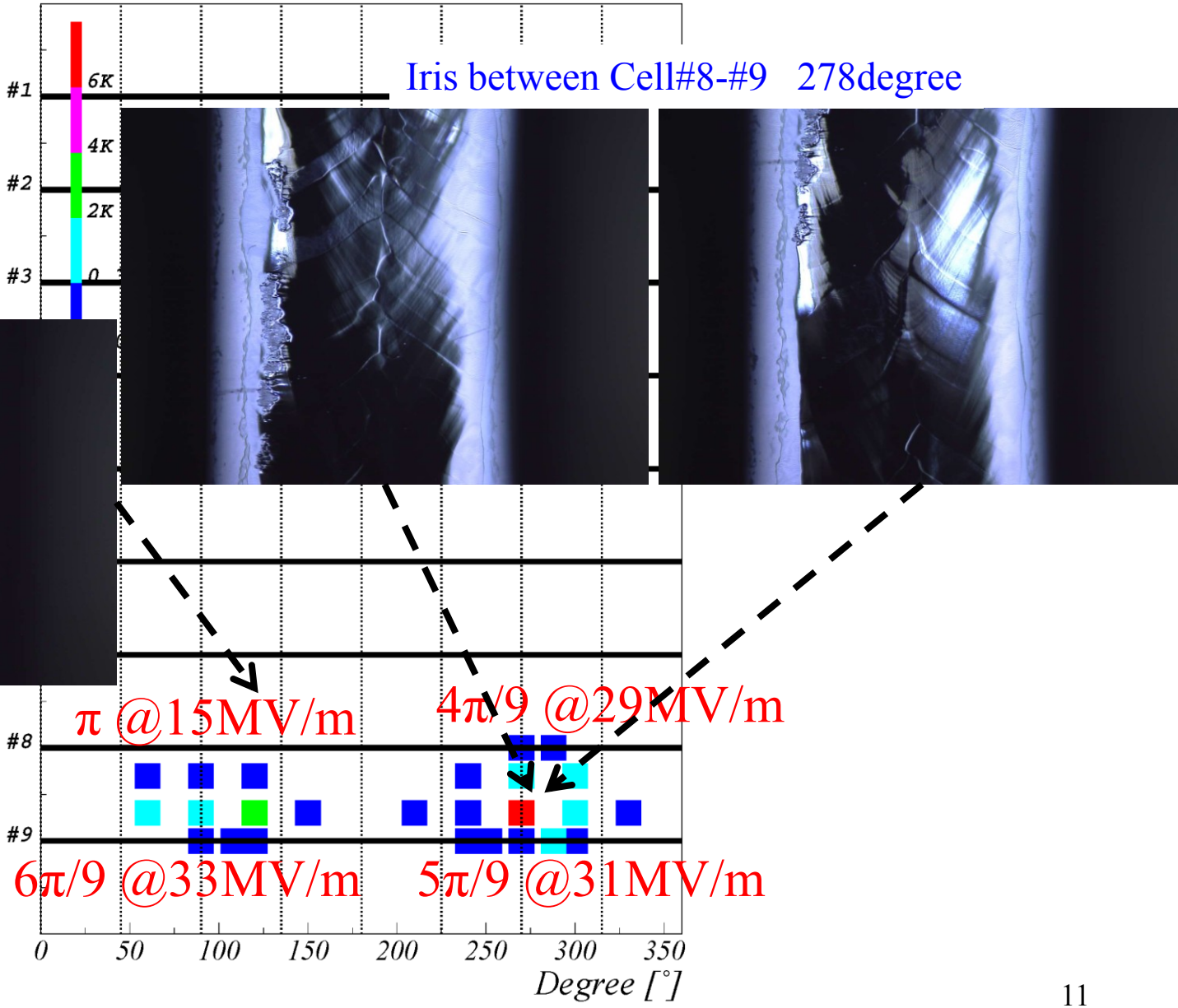
Potential Max. Gradient for MHI#14 @17/Feb/2011



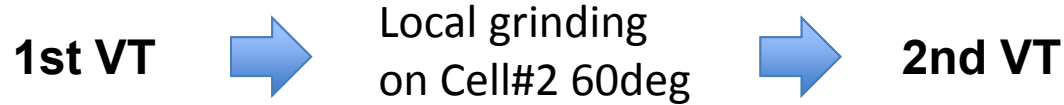
# Comparison of T-mapping and optical inspection

MHI-014  
after 1st VT

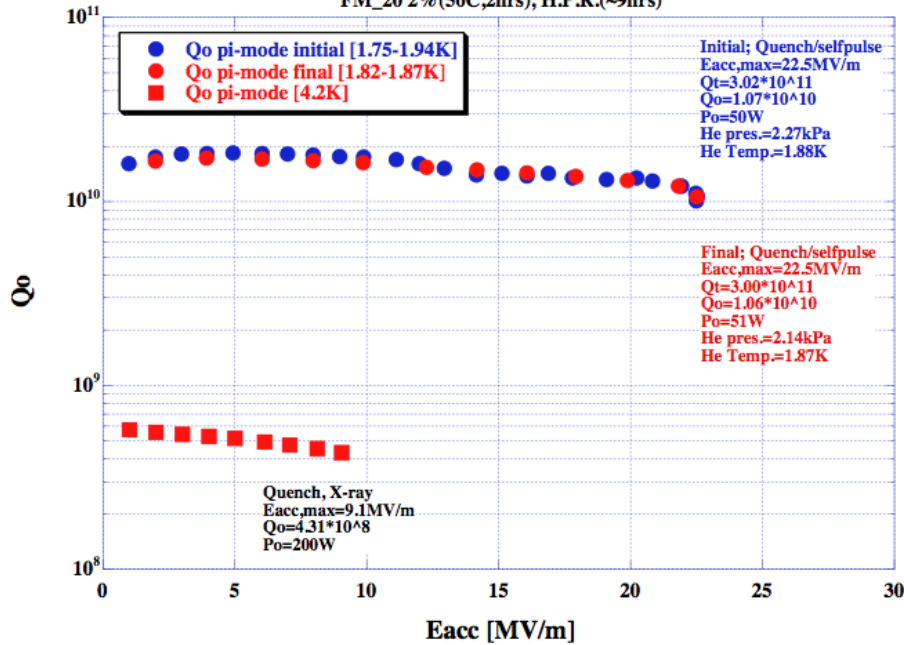
Iris between Cell#7-#8  
119degree



# MHI-015

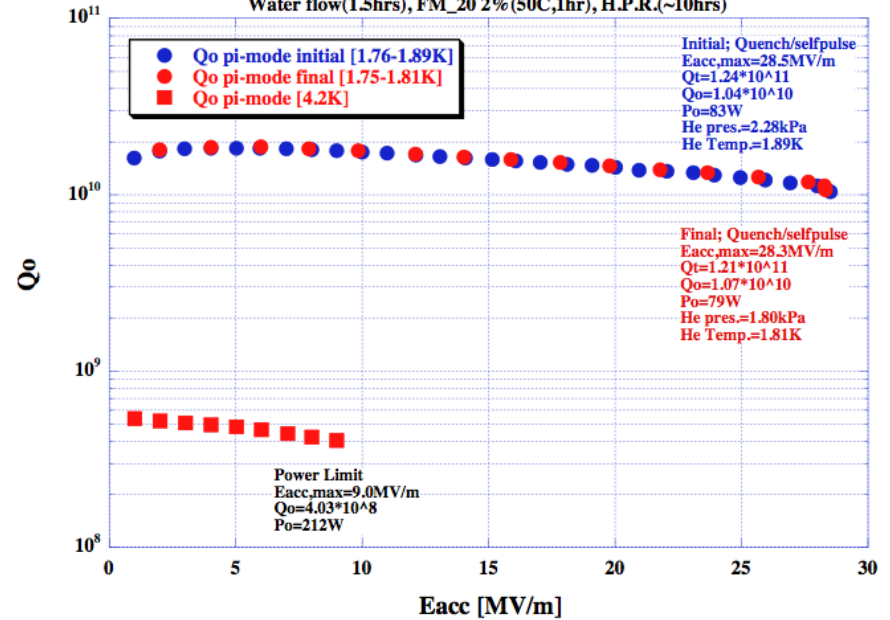


MHI No.15 1st. Vertical Test 02/03/2011  
EP-II(~37mA/cm2, 20μm), Improved Water flow(1.5hrs),  
FM\_20 2% (50C,2hrs), H.P.R.(~9hrs)



Quench at cell#2 60 degree,  
X-ray onset = 14MV/m

MHI No.15 2nd. Vertical Test 03/03/2011  
Local Grinding, EP-II(~37mA/cm2, 20μm),  
Water flow(1.5hrs), FM\_20 2% (50C,1hr), H.P.R.(~10hrs)

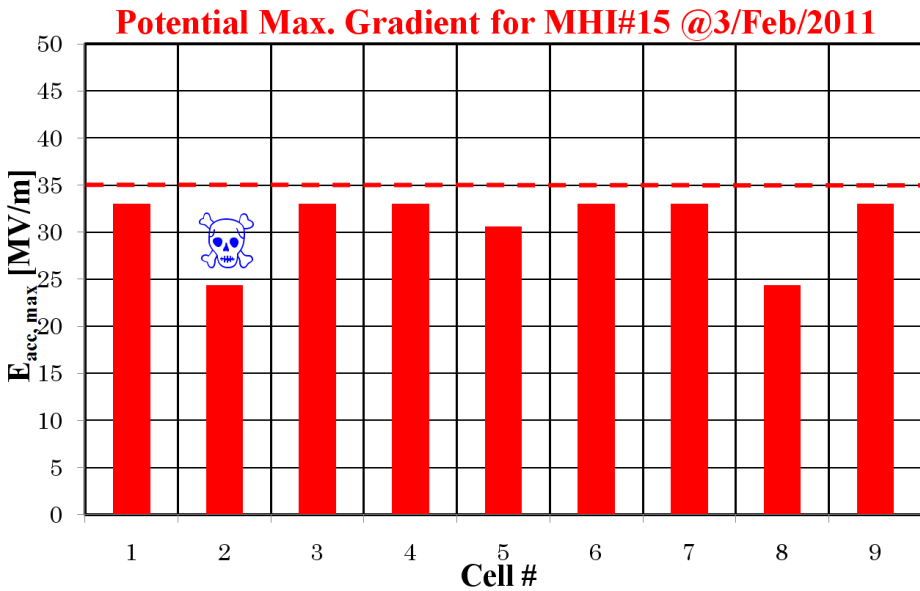


Quench at cell#9 0 degree,  
No X-ray up to 28MV/m

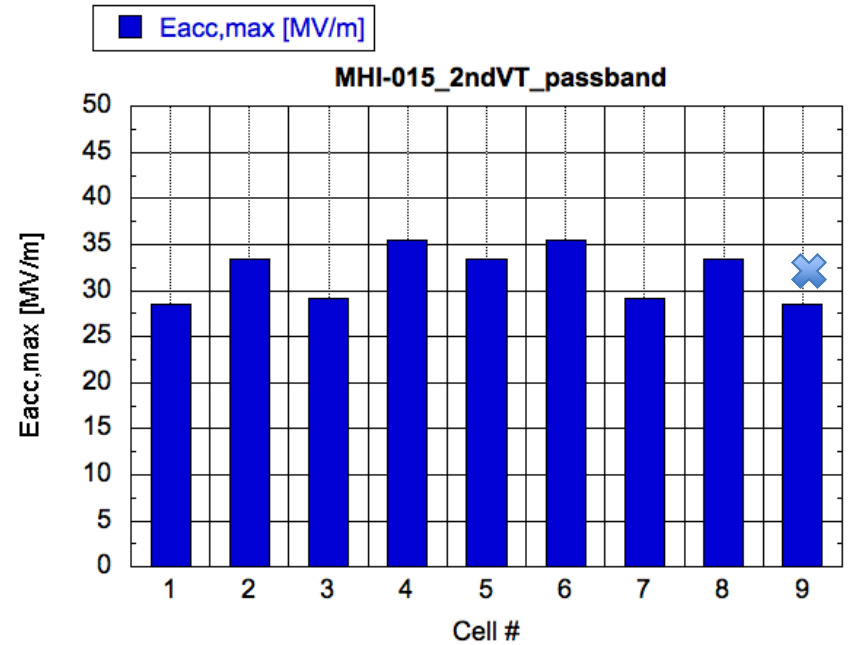
# MHI-015

## Pass-band mode excitation

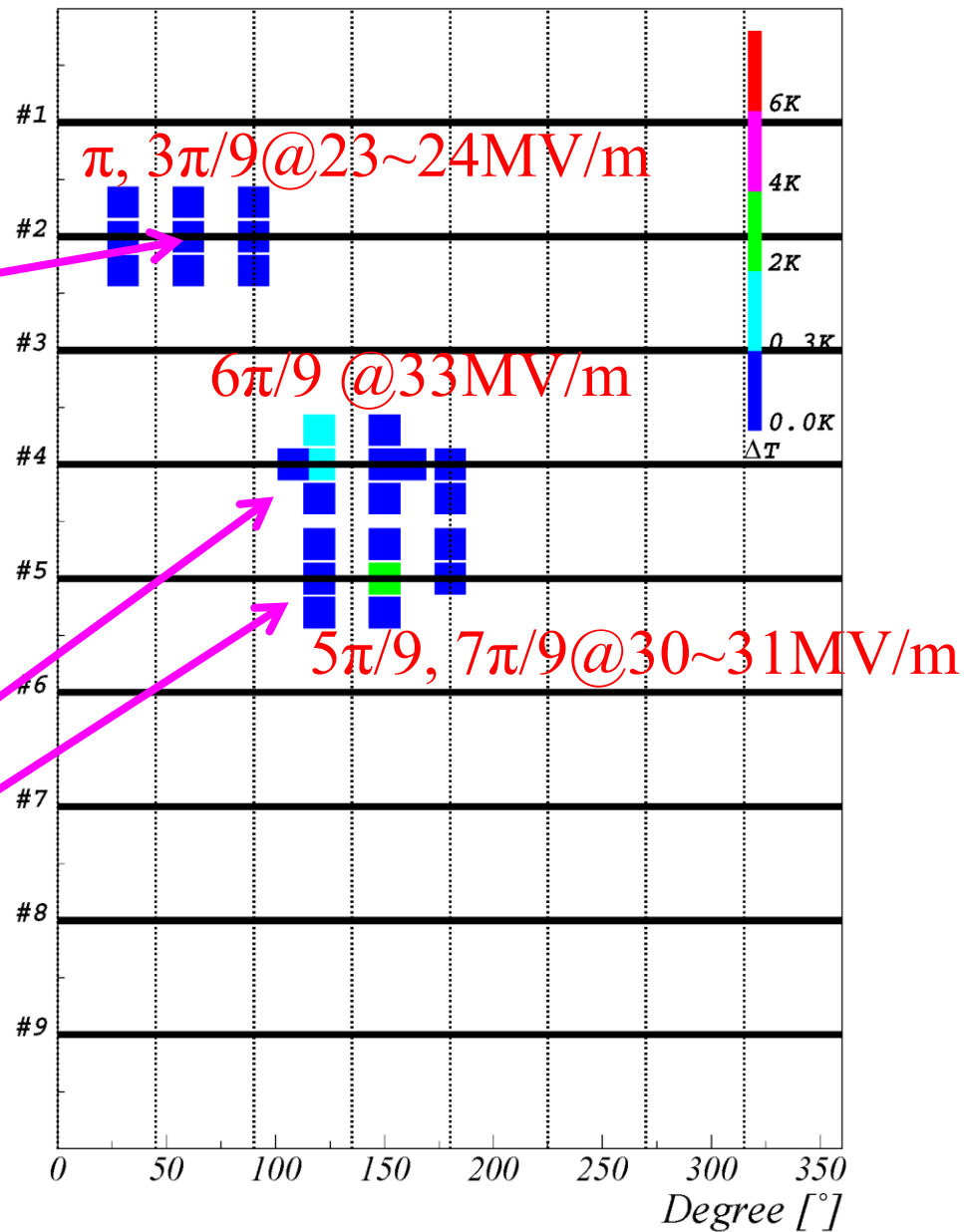
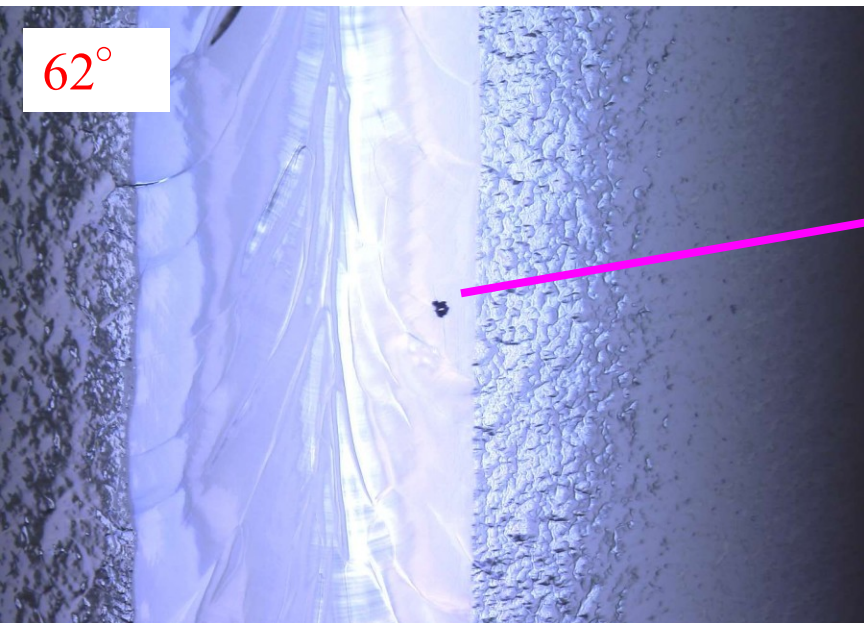
### 1st VT



### 2nd VT

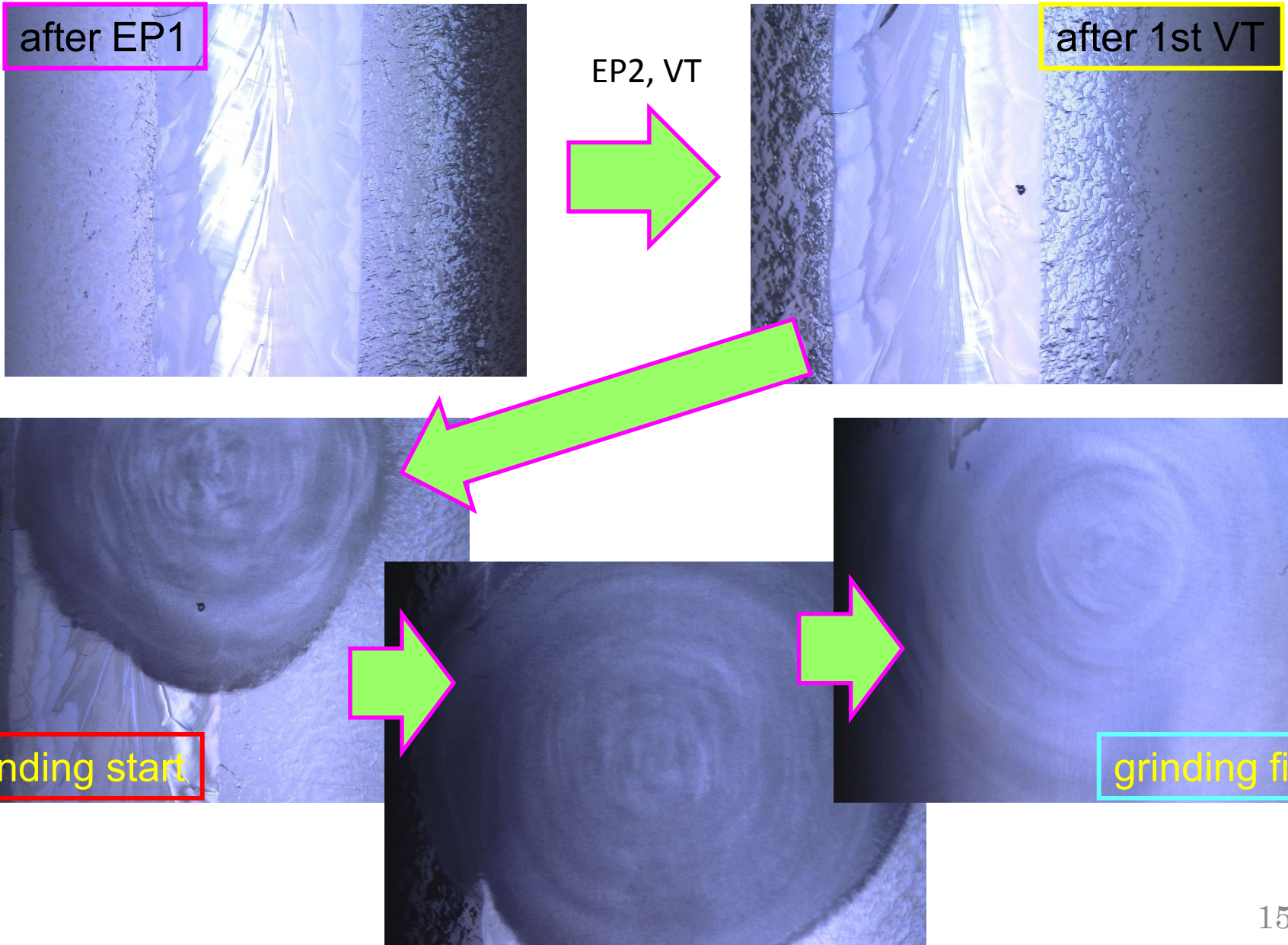


# Comparison of T-mapping and optical inspection



Nothing was found!

# Change of defect at Cell#2 equator

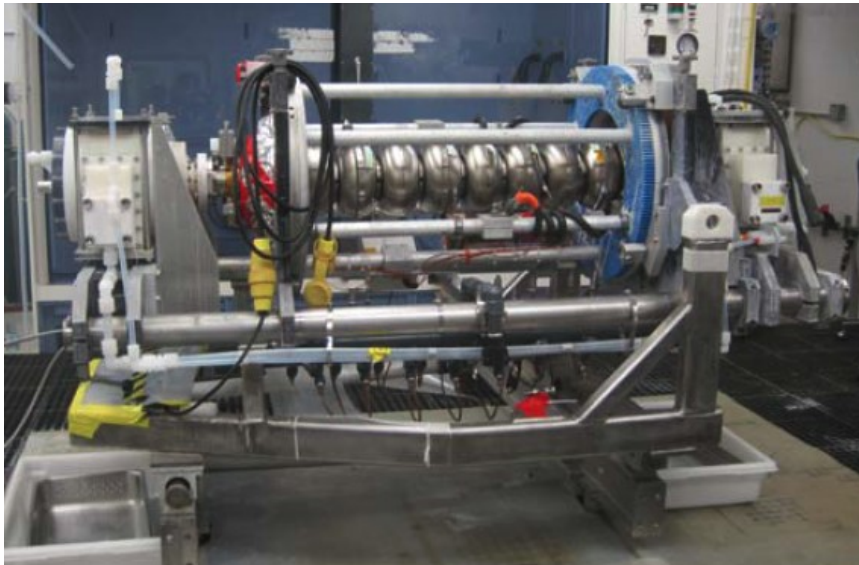


# Jlab-KEK collaboration

## ICHIRO#7 at JLAB

F. Furuta

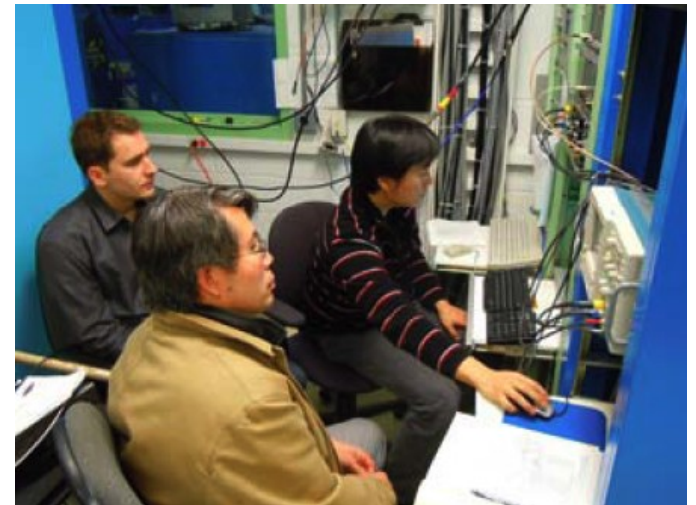
3 times EP, 7 times VT ; collaboration with JLAB



ICHIRO#7 EP at JLAB



Clean room work at JLAB

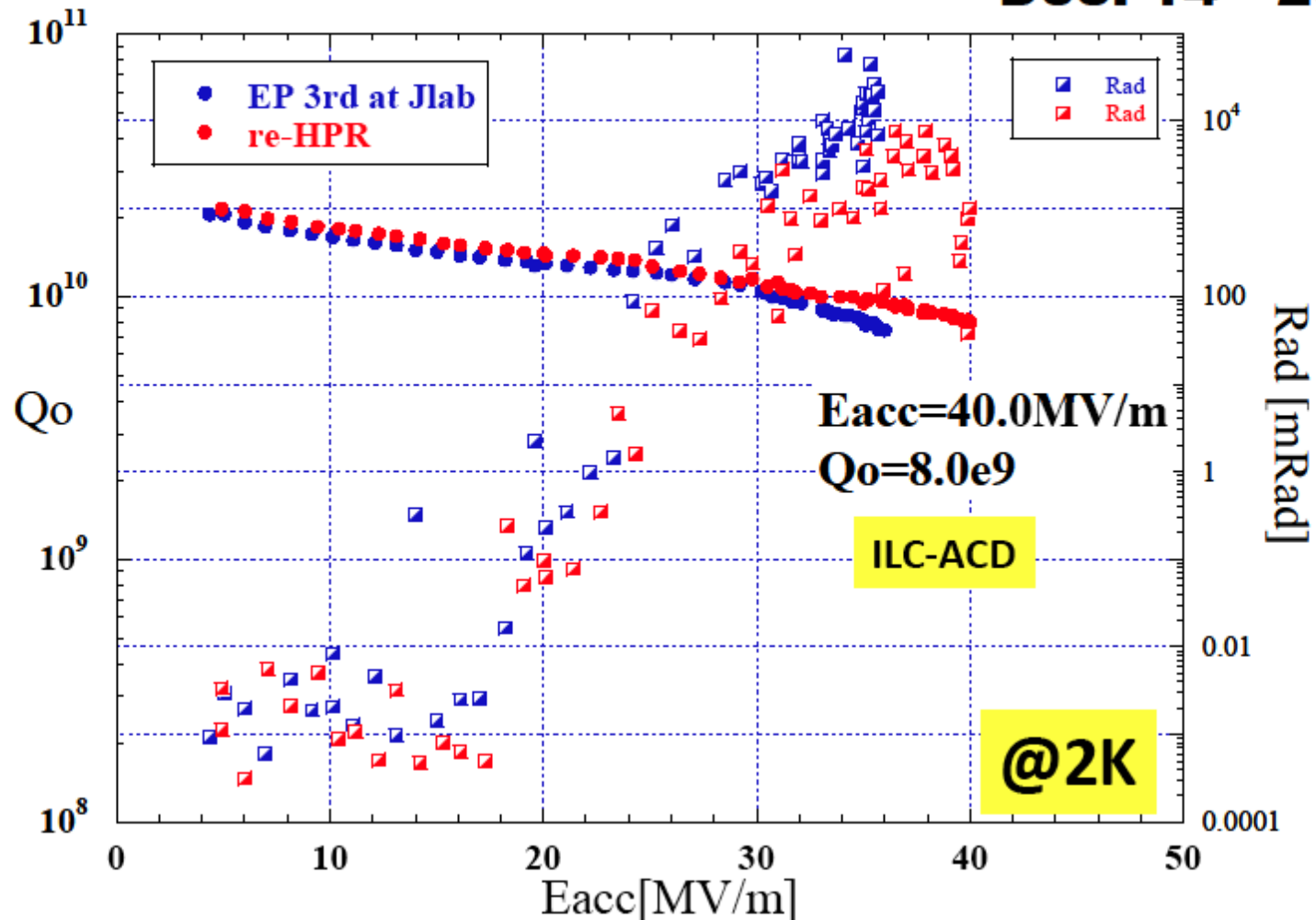


VT at JLAB



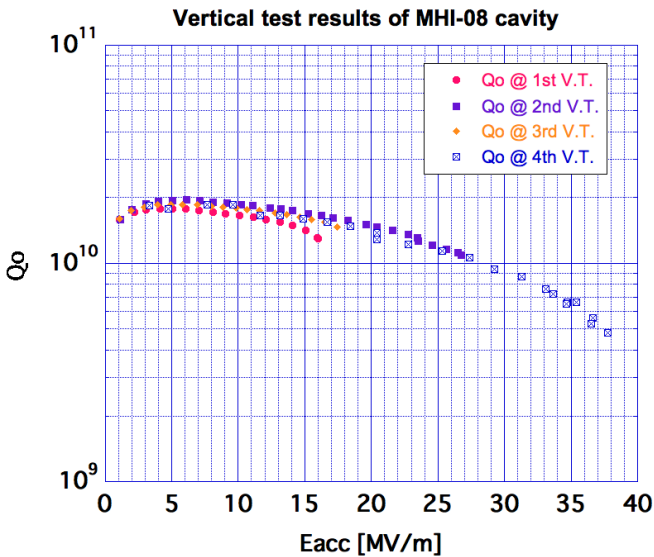
# ICHIRO#7 VT after re-HPR at Jlab

Dec. 14<sup>th</sup> 2010

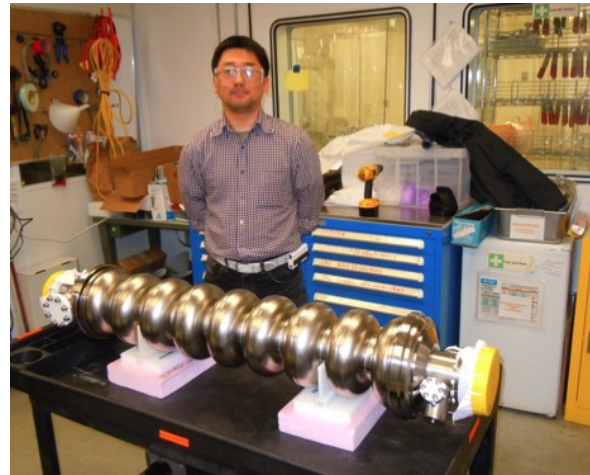


# MHI-08 at JLAB : direct comparison of STF process and Jlab process

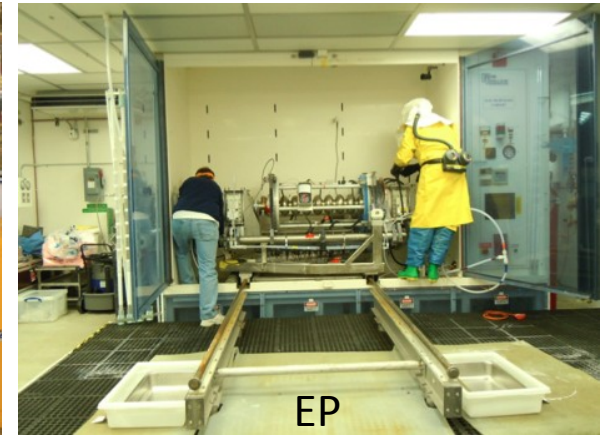
1 time EP, 2 times VT ; collaboration with JLAB



38MV/m reached cavity

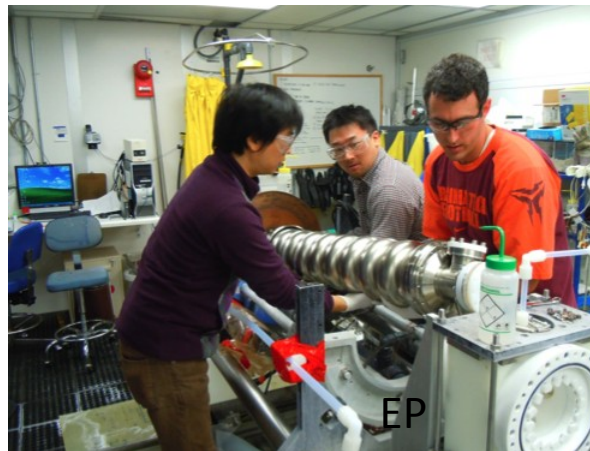


MHI-08 and Y. Yamamoto



EP

Y. Yamamoto and K. Watanabe

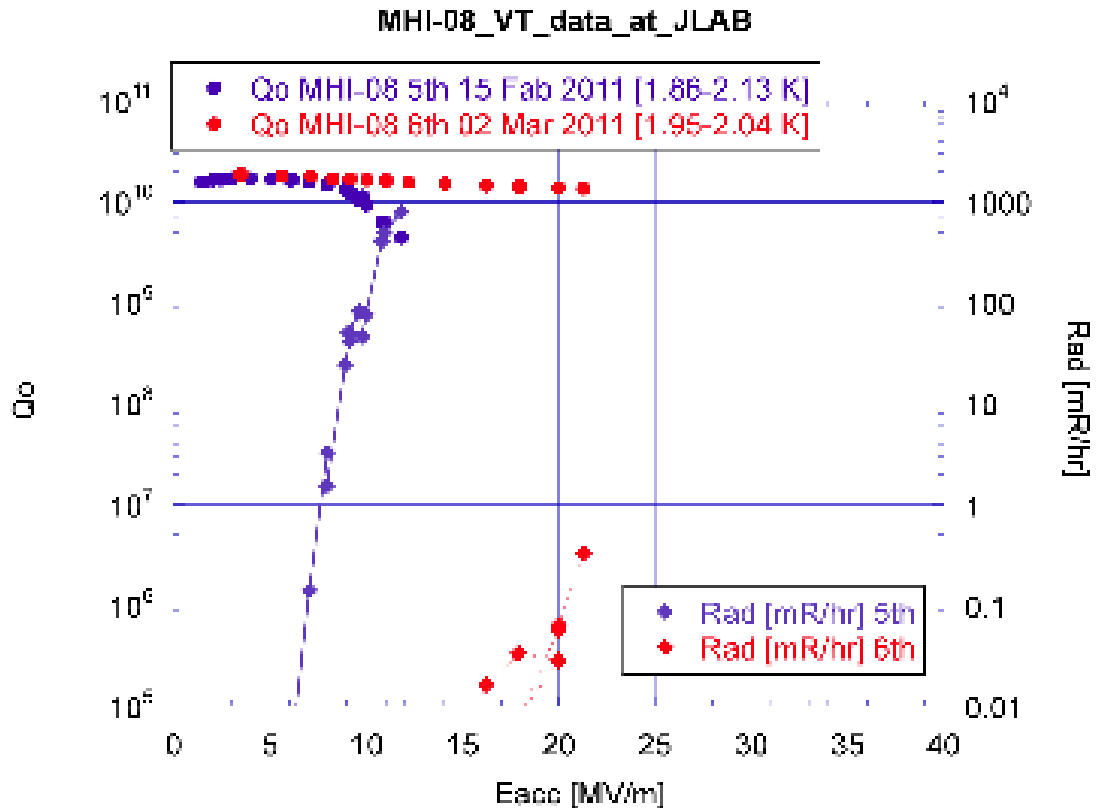


EP



HPR

# MHI-08 at Jlab



**1st VT : 12MV/m Field emission  
(pump broken during baking)**

**2nd VT : 22MV/m quench  
at cell#1 or cell#9**

**(26-29MV/m at cell#4 or cell#6)**

## Earthquake on March 11 14:46

Now STF activity was stopped by the AC power down of Big earthquake (March 11).  
Still AC power down and water down are continued, check and repair of AC line underway.

So far, two or three turbo-pump were damaged by sudden power stop and strong swing.  
MHI-16 baking was stopped by this pump down.

There was no cavity EP process and no vertical test on that day.

Instead, lab-EP was performed. Fortunately, acid overflow by the swing was not much.  
(a few 10ml to the floor)

We could safely terminated EP process immediately even AC power down and water down.  
There was no visible STF building damage, no visible infra-structure (EP, VT, clean-room)  
damage, no visible S1-G cryomodule damage, no visible RF power source damage, etc.

It will resume in April.

Very appreciate for warmhearted message from everyone.

end