# Alternate final rinsing

## K.Saito and WG-5 Asia

1) $H_2O_2$ rinsing
2) Degreasing effect after EP
3) Megasonic rinsing

# +EP(20$\mu$m)+H$_2$O$_2$(10%, 1hr @ 50$^O$C) rinse+HPR+Baking
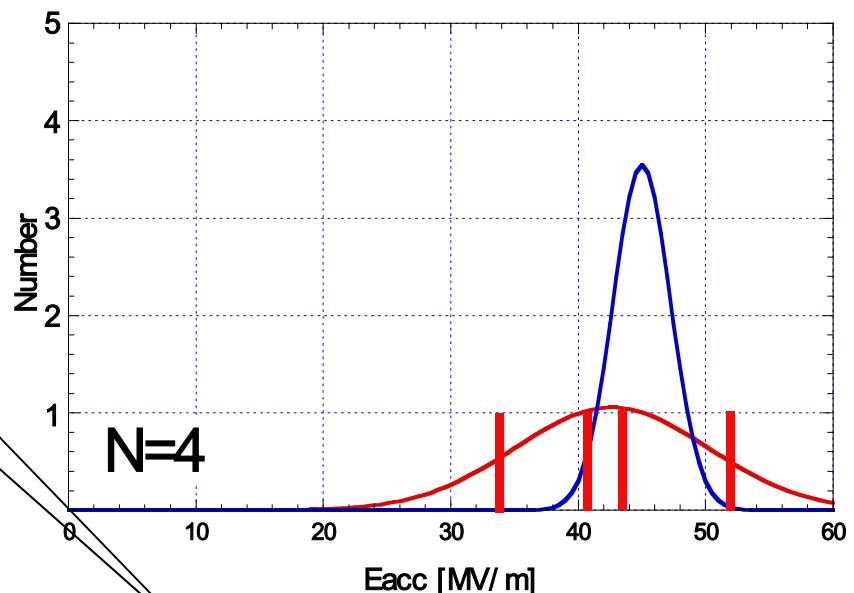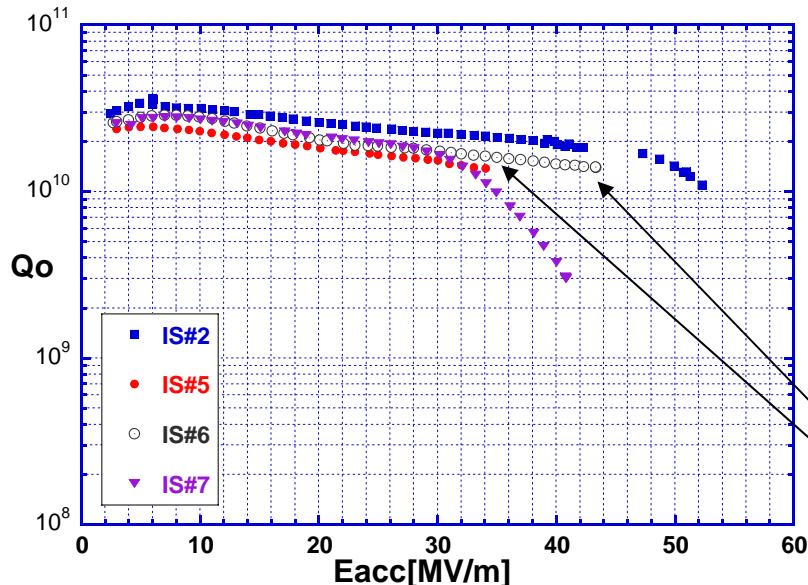


**Hard quench appears.**

**Ave. Eacc=42.6±7.6MV/m**

**Scattering:18%, Acceptability@40MV/m(ACD):50%**

|  |  | IS#2 | IS#3 | IS#4 | IS#5 | IS#6 | IS#7 |
|---|---|---|---|---|---|---|---|
| +EP(20) | Eacc | 52.3 |  |  | 34.1 | 43.4 | 40.9 |
| +H$_2$O$_2$ | Qo | 1.09e10 |  |  | 1.37e10 | 1.39e10 | 3.01e9 |

# +EP(20μm)+Degreasing(Micro90,1hr @ 60$^O$C)+HPR+Baking

**Very nice!**

N=3

Qo — Eacc[MV/m]

- ■ IS#3
- ● IS#4

Number — Eacc [MV/ m]
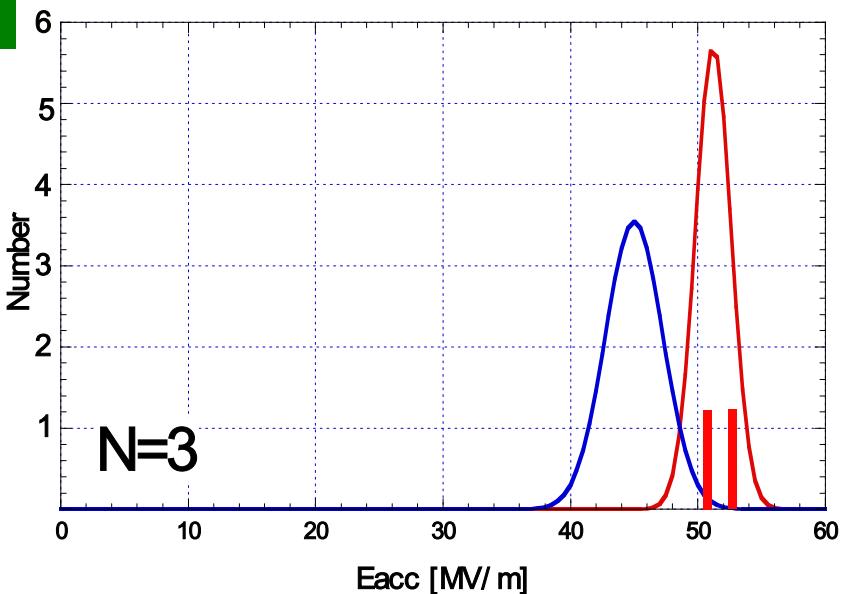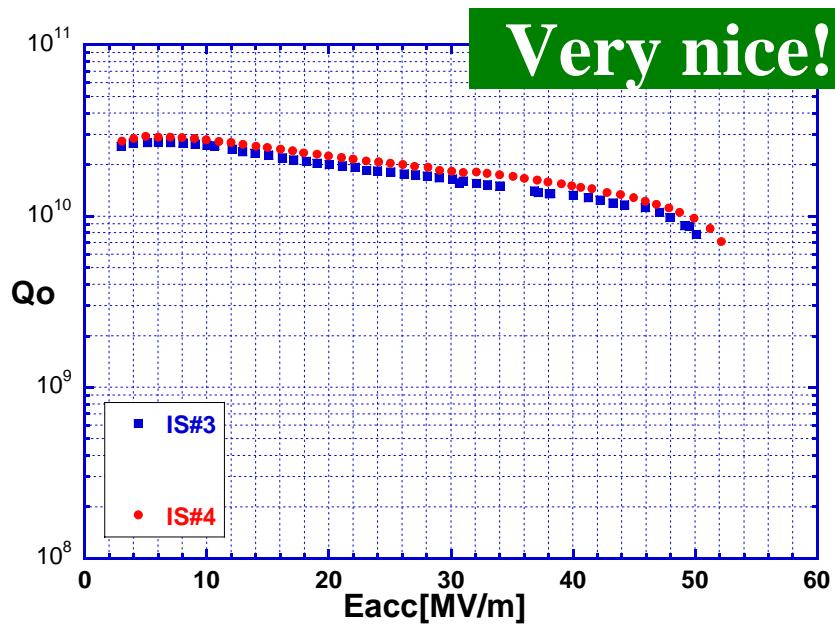
**Ave. Eacc=51.2±1.4MV/m**

**Scattering:3%, Acceptability@40MV/m(ACD):100%**

|  |  | IS#2 | IS#3 | IS#4 | IS#5 | IS#6 | IS#7 | IS#8 |
|---|---|---|---|---|---|---|---|---|
| +EP(20) +Degreasing | Eacc |  | 50.13 | 52.16 |  |  |  |  |
|  | Qo |  | 7.80e9 | 7.08e9 |  |  |  |  |

# **Multipacting**
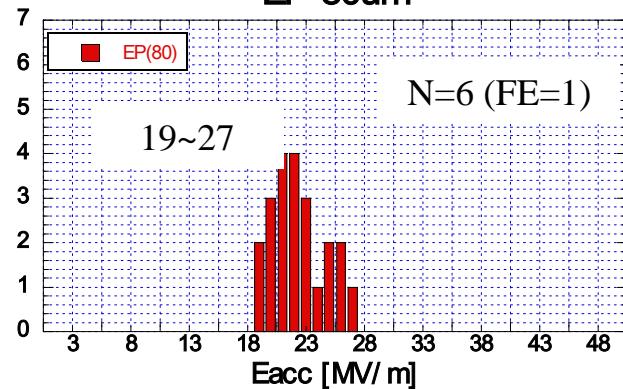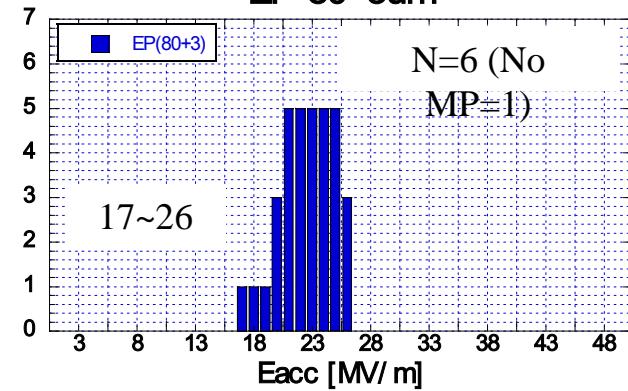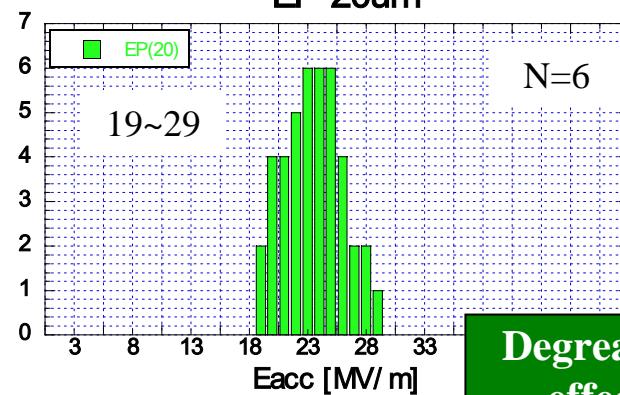


Degreasing or $H_2O_2$ rinsing is effective to suppress MP!
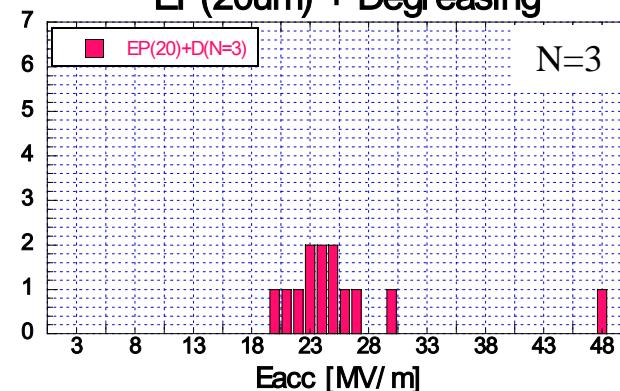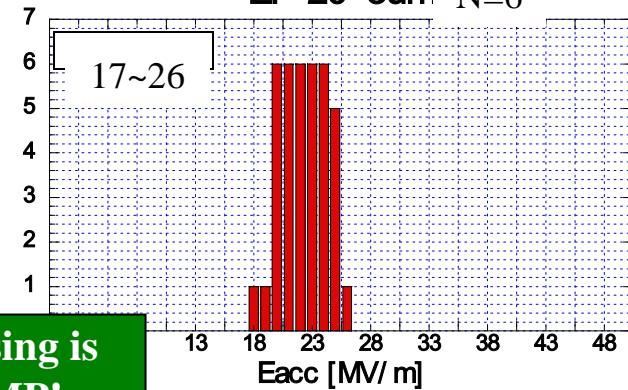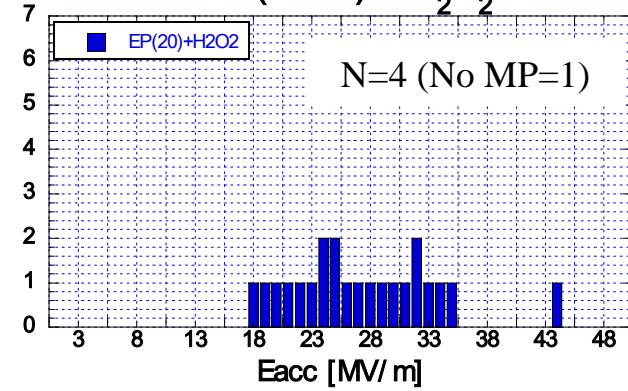
# Degreasing effect on
# oil contamination in HPR system

# HPR pump @ KEK : KÄRCHER HDS8/14C

**Replaced to new HPR pump @ Nomura**
**(plunger type)**



**The maker shipped the pump filling Ethylene-glycol.**

HPR final filter was contaminated due to
new plunger, poor rinsing for ethylene-glycol or other reason.

Contaminated filter

New filter





Oil ?

IS#2- total 22nd
6th meas. after reset

2007/ 2/ 28 Wed.

Qo

$10^{11}$

X- ray started
from 32MV/ m.

$10^{10}$

MP is very light
Quench happened only 3 times
    @25MV/ m,
    @32MV/ m,
    @44MV/ m

limited by
quench

$10^9$

Eacc=52.3MV/ m
Qo=1.09e10 @2K

$10^8$

EP(20)+H2O2 rinse+HPR(UPW@Nomura, 2/21)
TOC=4ppb, Bacteria=0

0    10    20    30    40    50    60

Eacc [MV/ m]
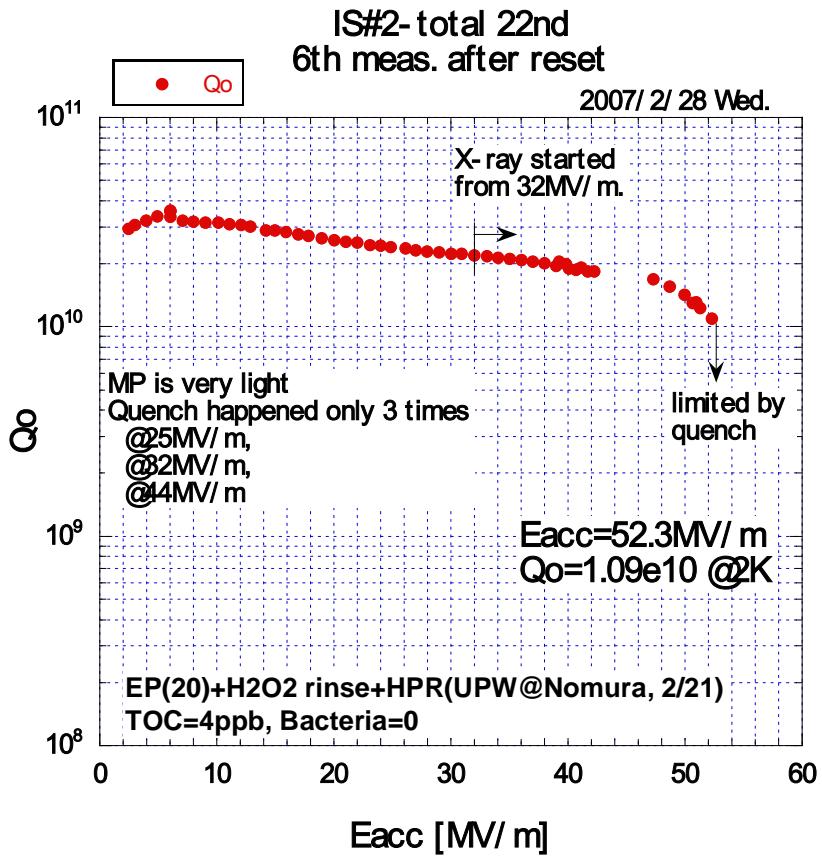
Before the HPR contamination
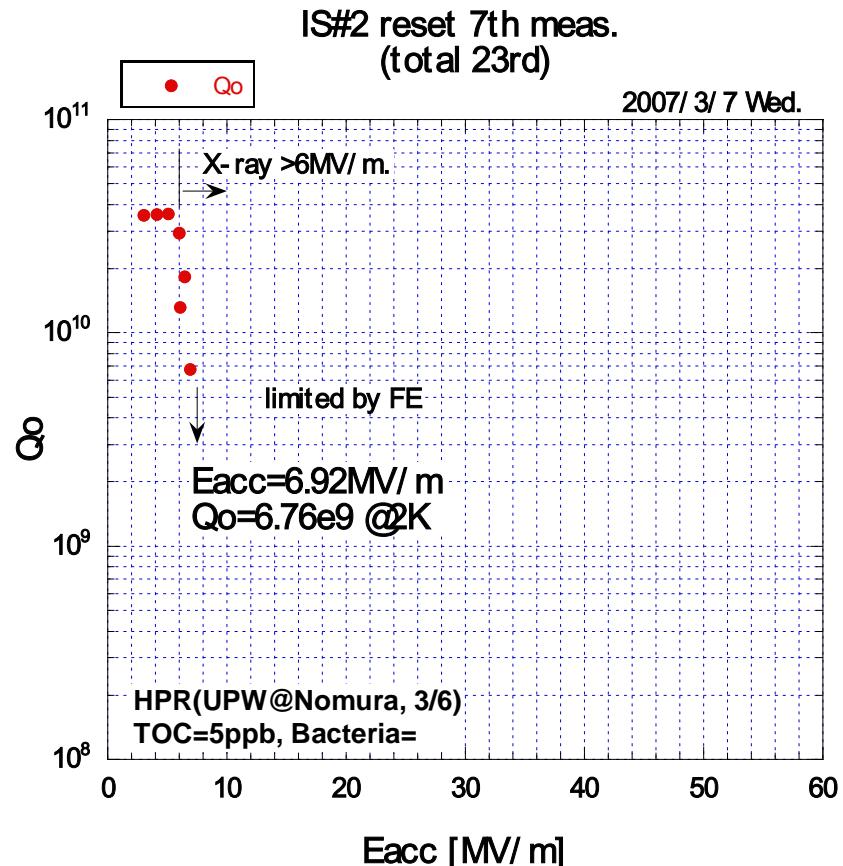
IS#2 reset 7th meas.
(total 23rd)

2007/ 3/ 7 Wed.

Qo

$10^{11}$

X- ray >6MV/ m.

$10^{10}$

limited by FE

Eacc=6.92MV/ m
Qo=6.76e9 @2K

$10^9$

HPR(UPW@Nomura, 3/6)
TOC=5ppb, Bacteria=

$10^8$

0    10    20    30    40    50    60

Eacc [MV/ m]

After the HPR contamination

### IS#2 reset 8th meas. (total 24th)

2007/ 3/ 9 Fri.

Qo

MP 22~35MV/ m, 12min.

X- ray >20MV/ m.

limited by FE

Eacc=36.7MV/ m
Qo=3.65e9 @2K

$Q_o$

**HPR(PW@KEK, 3/8)**
**TOC=210~160ppb, Bacteria=5~3**

Eacc [MV/ m]

### IS#2 reset 9th meas. (total 25th)

2007/ 3/ 20 Tue.

Qo

MP 23.5 ~25MV/ m, 20min.

X- ray >28MV/ m,
less then 0.8 uSv/ h

quench

Eacc=42MV/ m
Qo=1.83e10 @2K

$Q_o$

**Degreasing(1 h) +HPR(PW@KEK, 3/17)**
**TOC=133~140ppb, Bacteria=8~6**

Eacc [MV/ m]

**(Use Japanese degreaser)**
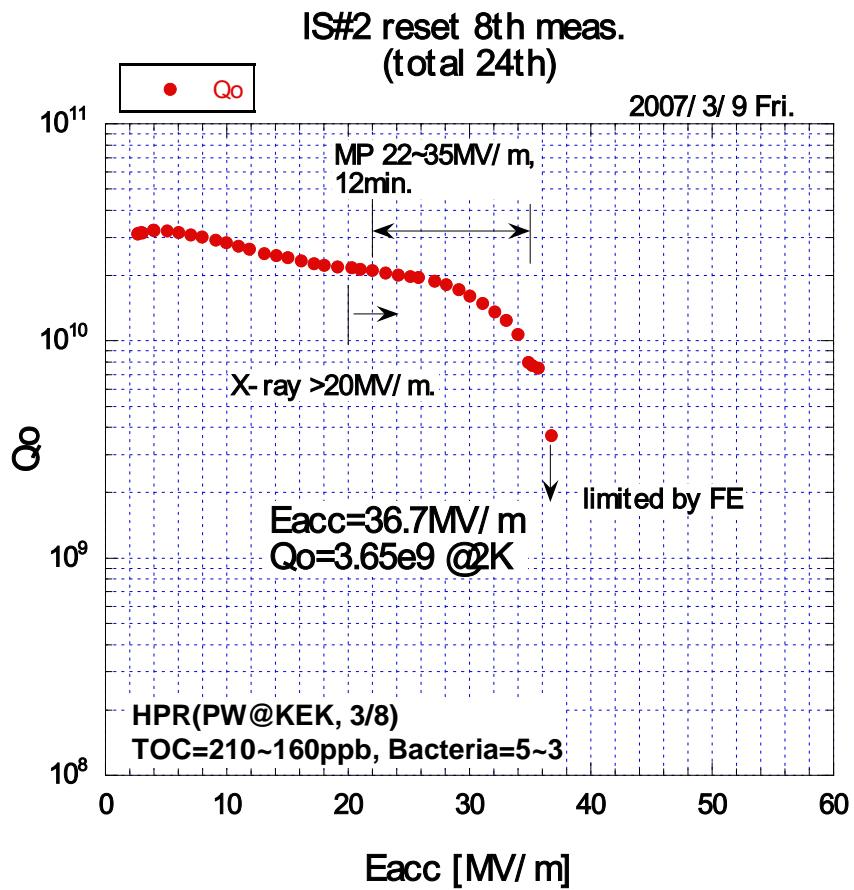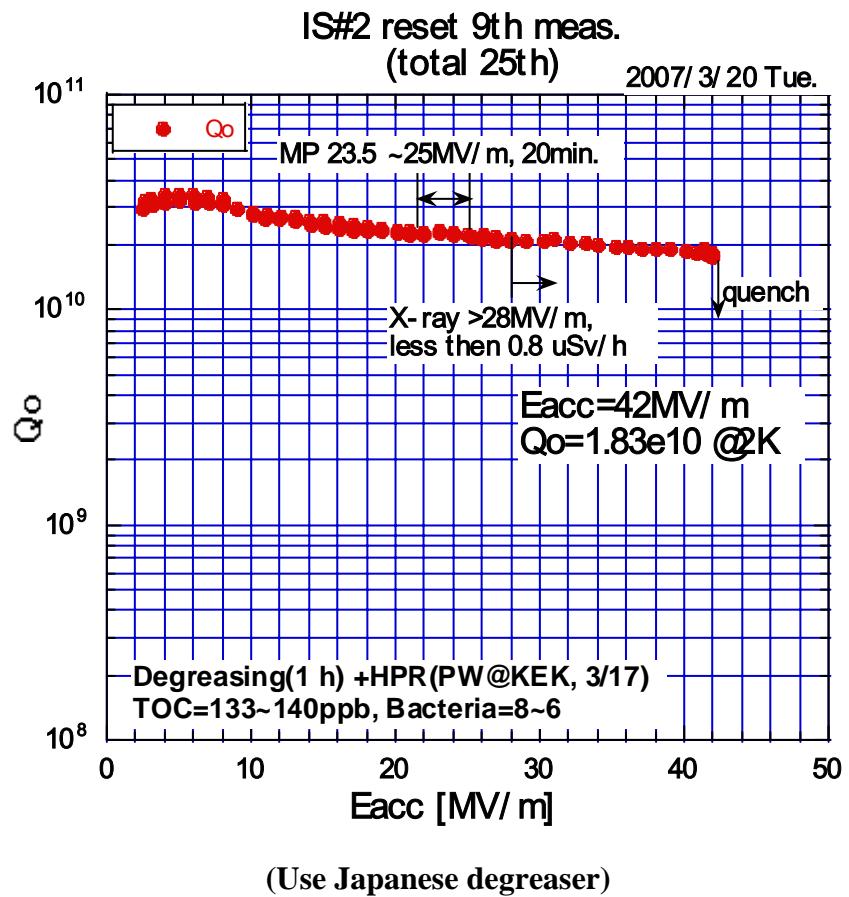
**Degreasing is very much effective to eliminate contamination !**

# HPR has too much contamination trouble now!

KEK will start investigation of Megasonic.

# Summary

1) $H_2O_2$ rinsing is effective to suppress multipacting
   but often limits the gradient by hard quench.
2) Degreasing is so promising and very effective to eliminate
   oil contamination.
3) HPR has too much trouble at KEK now, we will start to
   investigate Megasonic rinsing.