

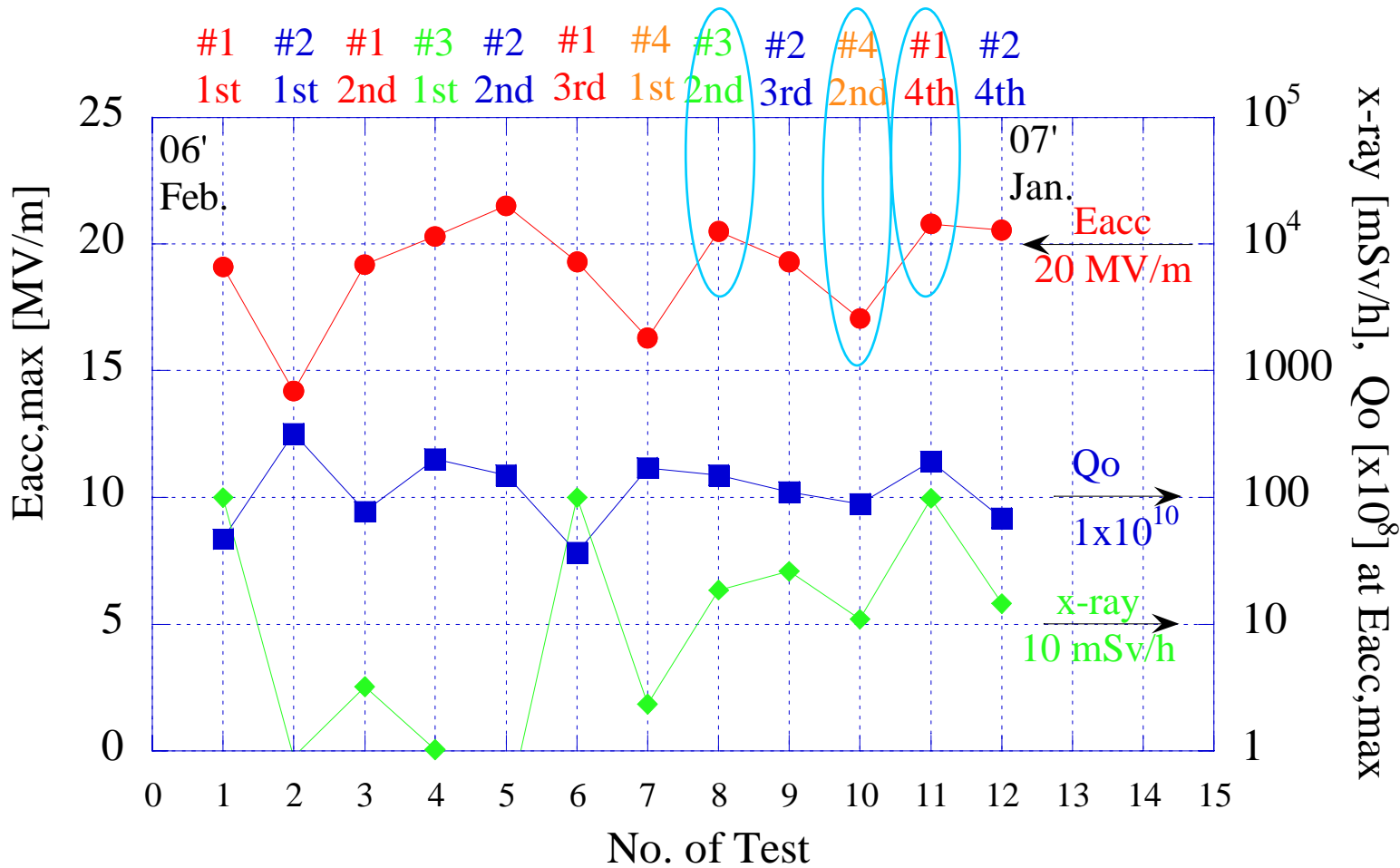
Excitation of the Passband Mode in the STF Baseline Cavities at KEK

Eiji Kako (KEK, Japan)

STF Baseline Cavities

Strange Qo behavior
3 times in 3 cavities

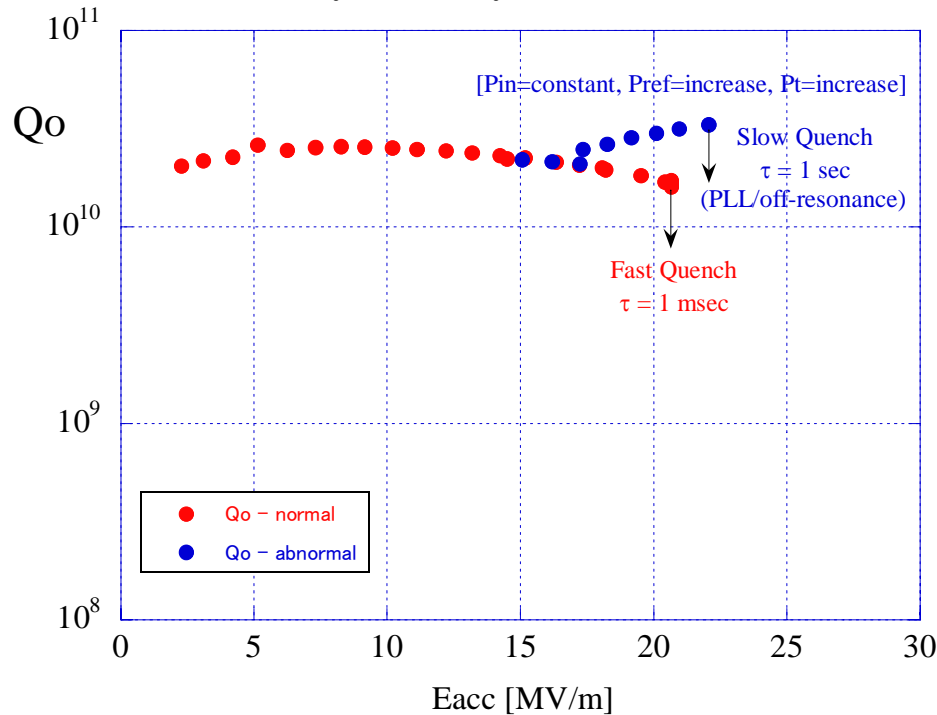
Summary of Vertical Tests (12 tests for 4 cavities)



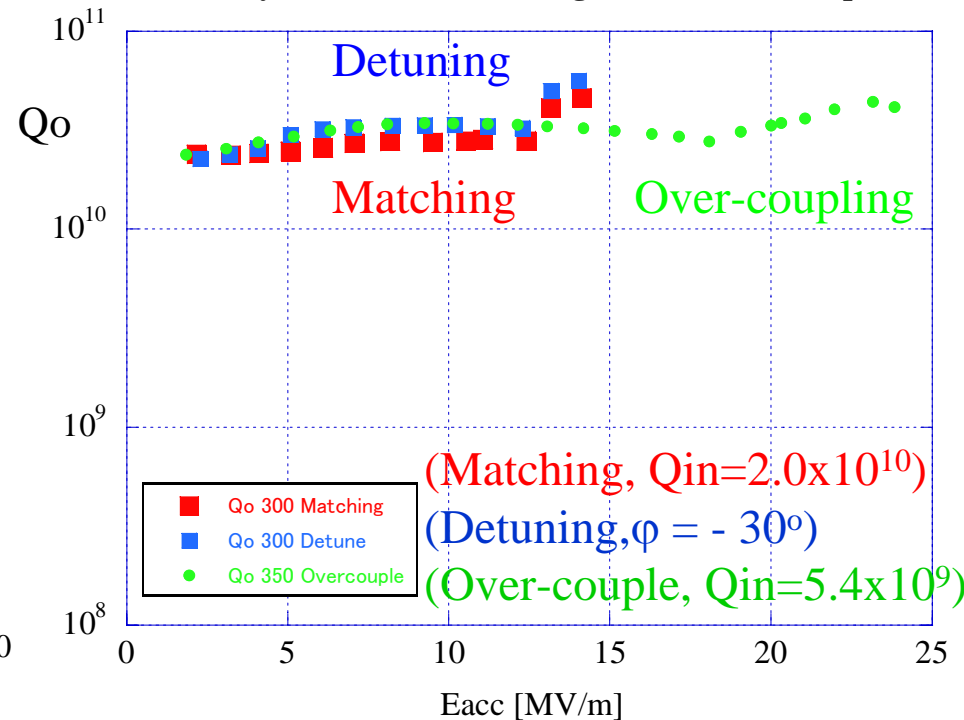
#1 Cavity – 4th Test

#3 Cavity – 2nd Test

Summary / #1 Cavity - 4th Tests (π mode)



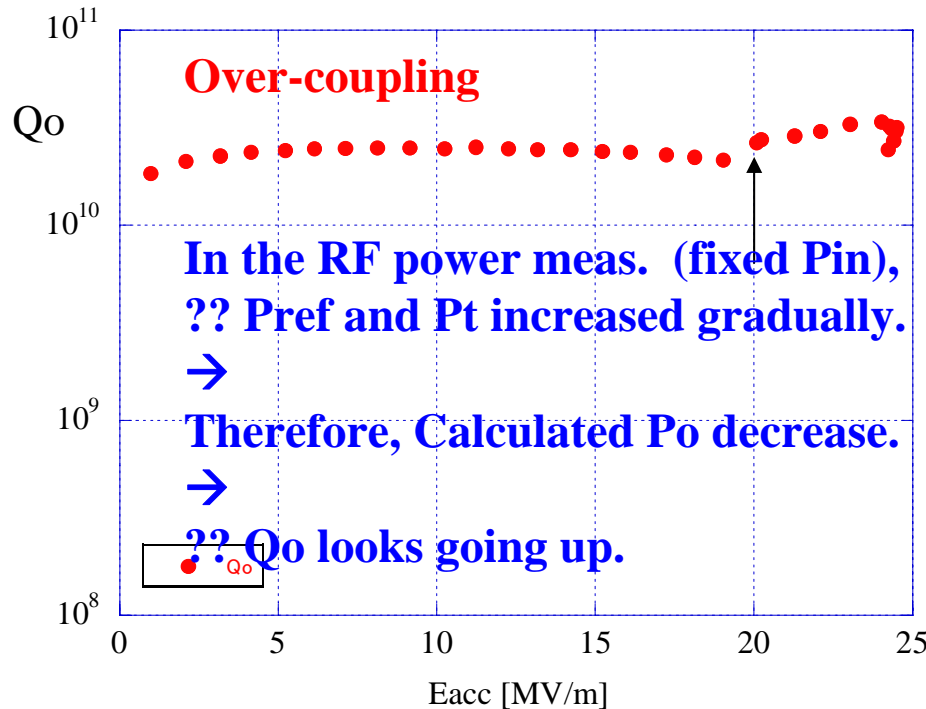
Summary (Qo-Eacc) / Matching, Detune, Overcouple



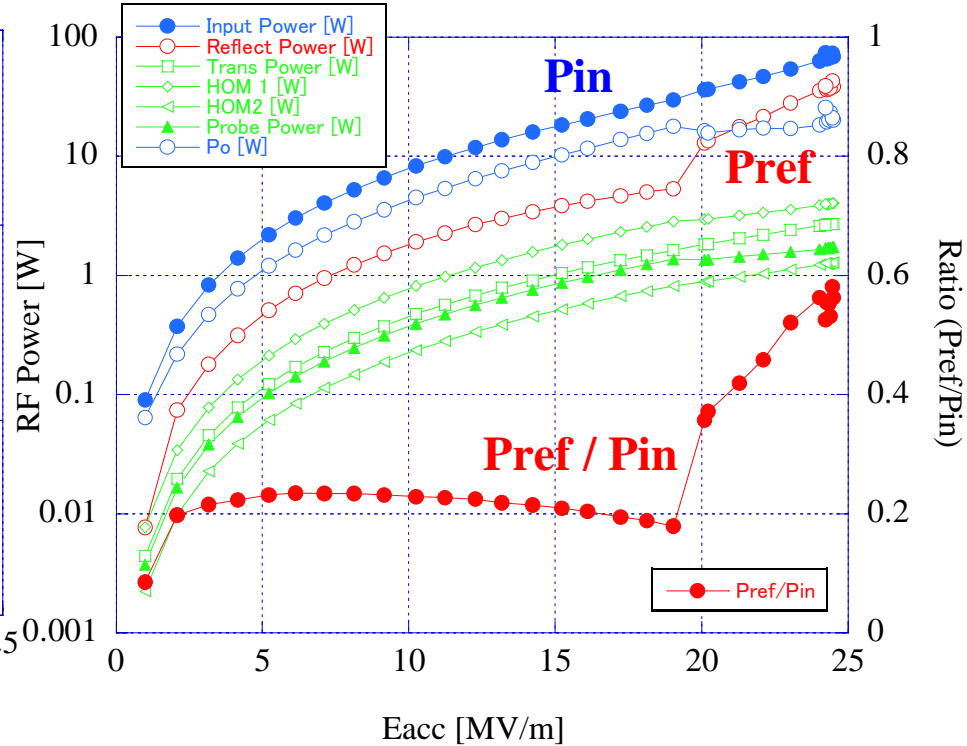
Strange Phenomenon ; ?? The Qo value goes up with the Eacc ??

#3 Cavity – 2nd Test

Summary (Qo-Eacc) Data_20060921_a1 / Coupler350

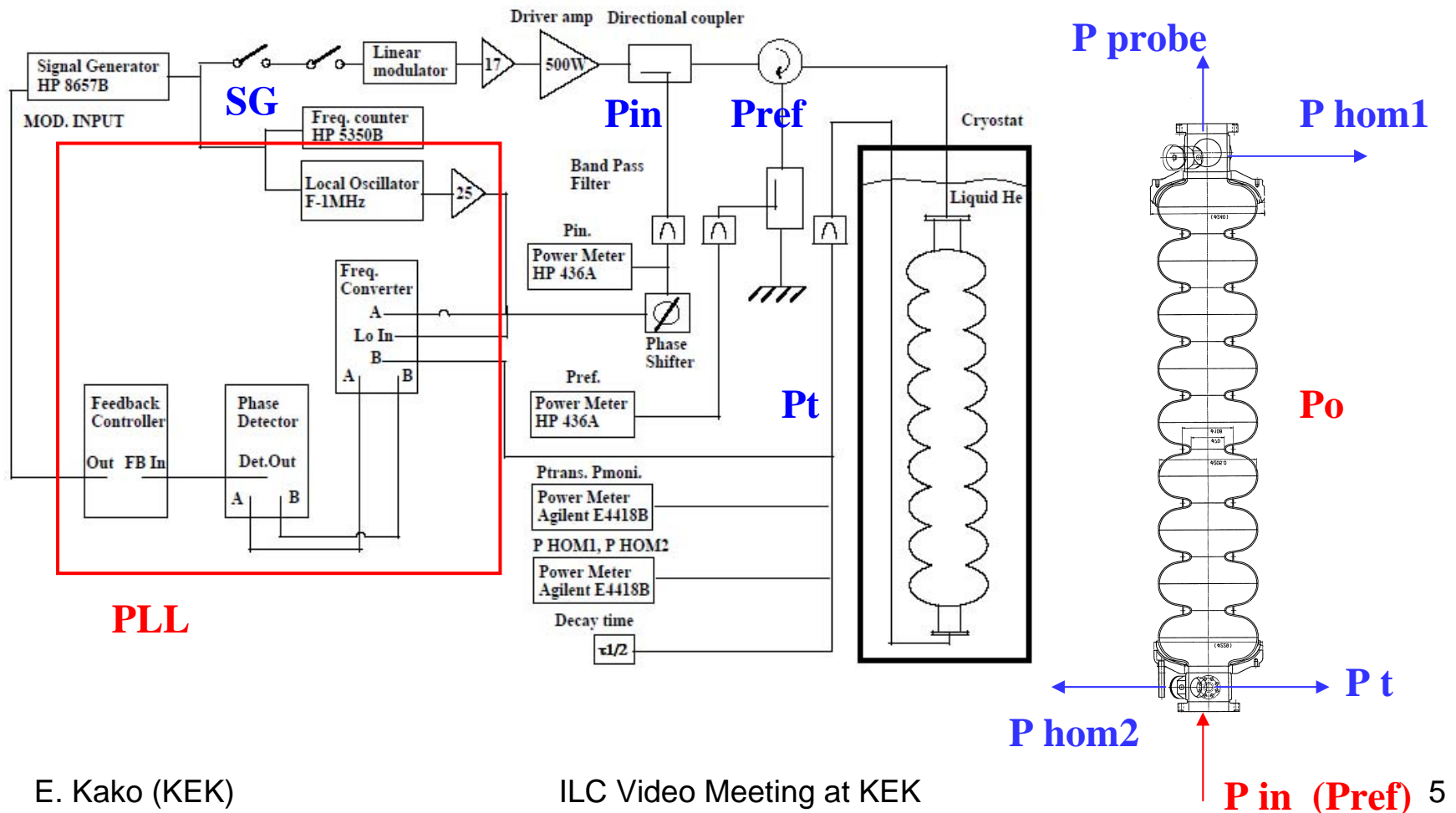


Summary (Qo-Eacc) Data_20060921_a1 / Coupler 350



RF System for Vertical Test

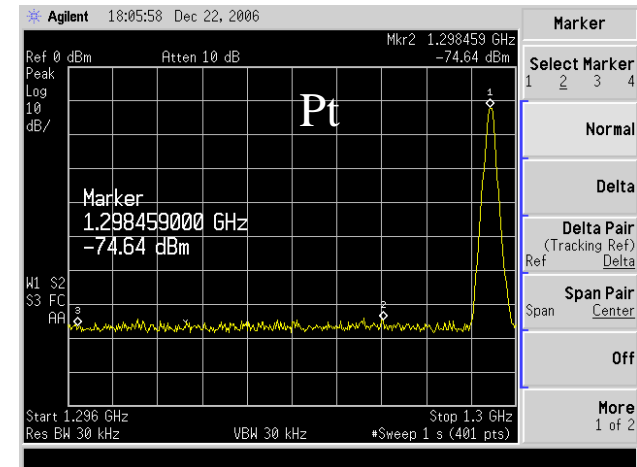
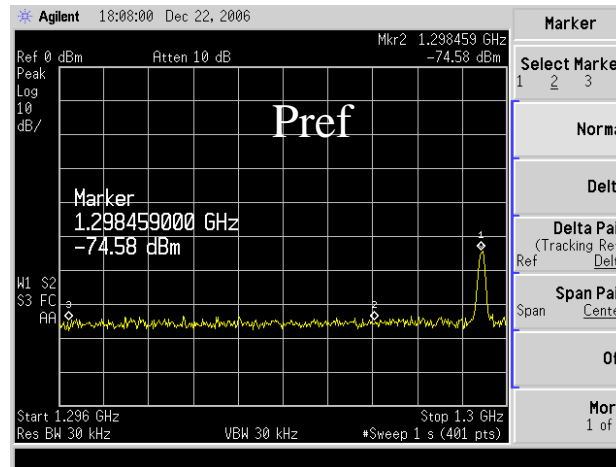
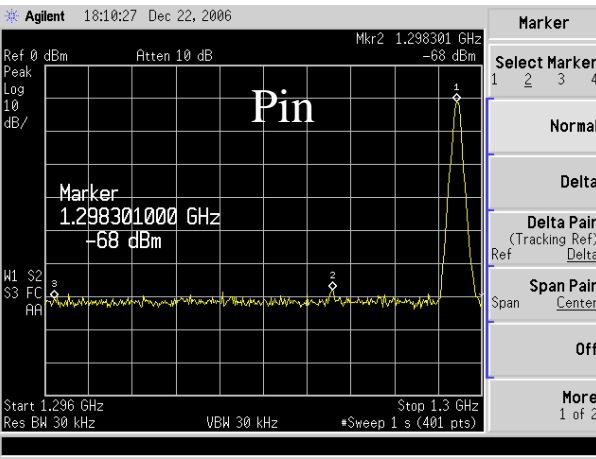
Checking of the Frequency Spectrum
in each monitored RF Power



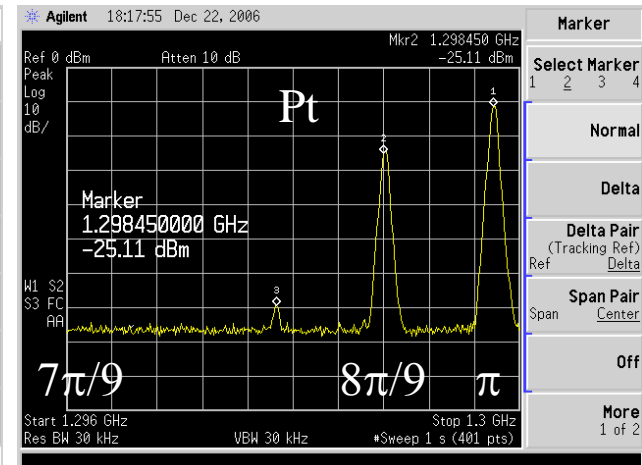
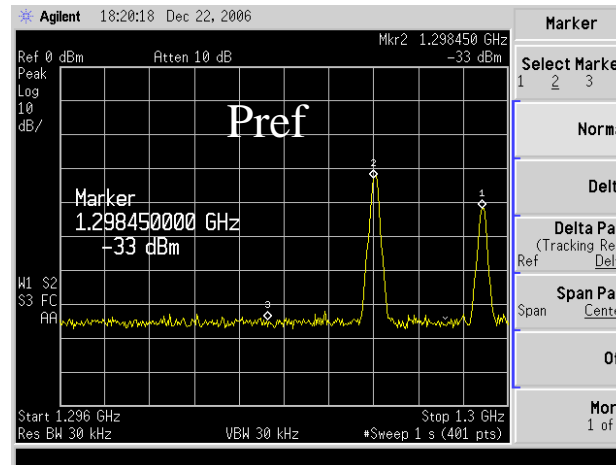
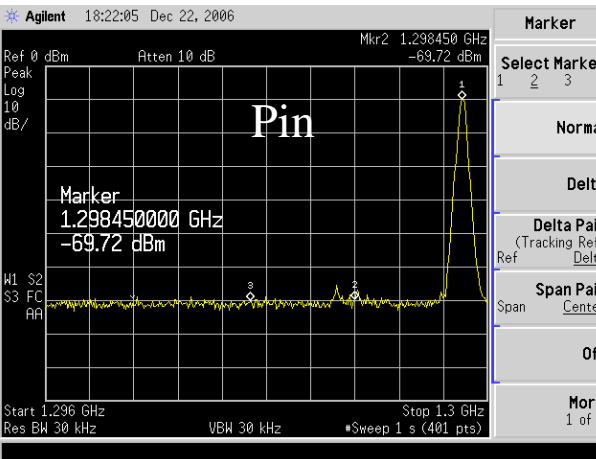
#1 Cavity – 4th Test

π mode : 1299.30 MHz
 $8\pi/9$ mode : 1298.46 MHz
 $7\pi/9$ mode : 1296.06 MHz

Normal state; Eacc= 14.2 MV/m, Qo=2.5 E+10



Abnormal state; Eacc= 16.2 MV/m, Qo=2.4 E+10



E. Kako (KEK)

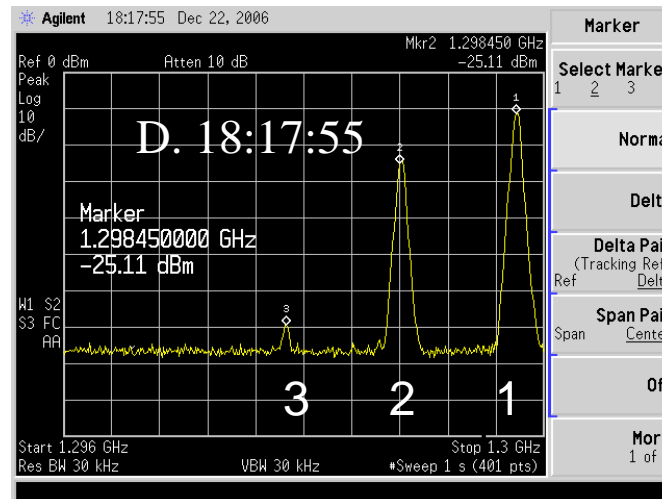
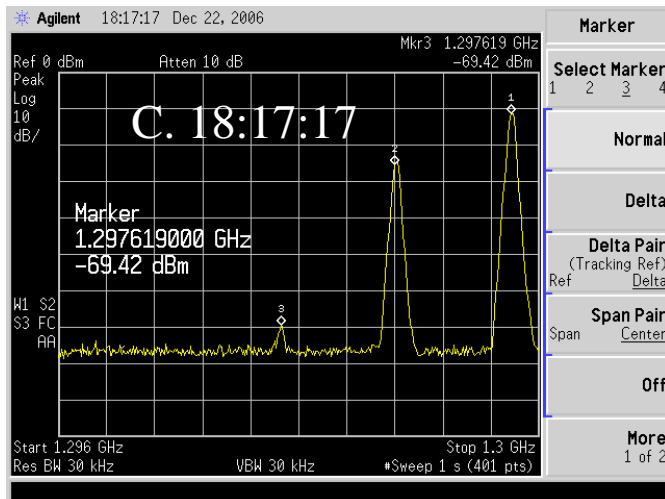
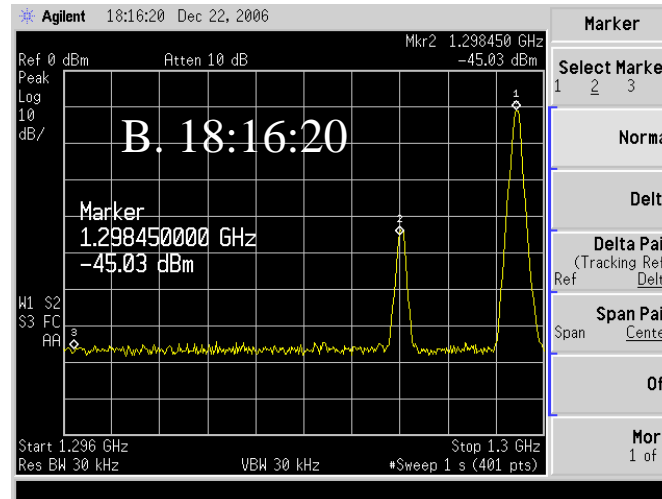
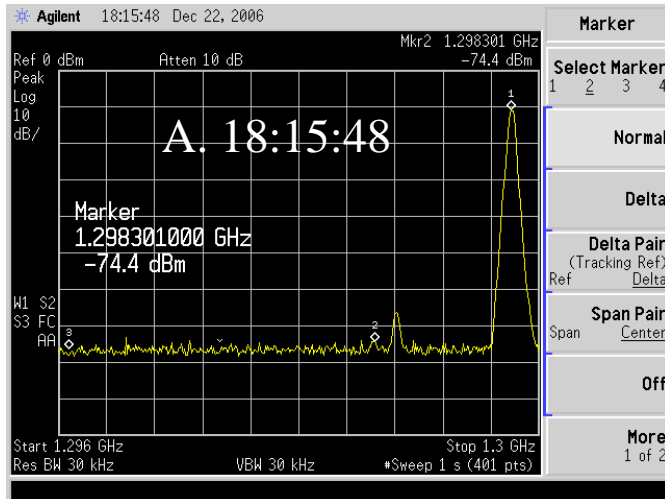
ILC Video Meeting at KEK
 2007, Jan. 24

$8\pi/9$ mode is excited inside the cavity !! 6

#1 Cavity – 4th Test

Abnormal state; $E_{acc} = 16.2$ MV/m, $Q_0 = 2.4 \times 10^{10}$

Pt signal



Build-up Time = about 1 min.

- 1 : 1299.30 MHz
- π mode
- 2 : 1298.46 MHz
- $8\pi/9$ mode
- 3 : 1297.62 MHz
- side-band

$\Delta f = 0.84$ MHz

SUMMARY

- In the latest vertical tests at KEK, strange Q_0 behavior was observed three times in three cavities.
- Increase of the monitored reflected power and transmitted power was observed during the fixed input rf power.
- This phenomenon was caused by the excitation of the passband mode (**TM₀₁₀- $8\pi/9$ mode**).
- Starting field level (E_{acc}) of the excitation has relation to the **input antenna coupling** (not rf power level).
- The build-up time of the excited mode was very slow ; **about one minute**.