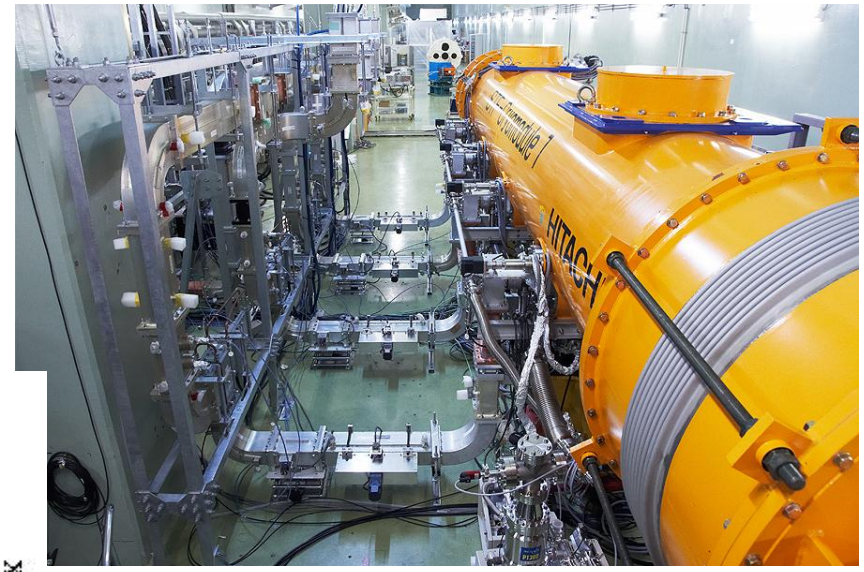
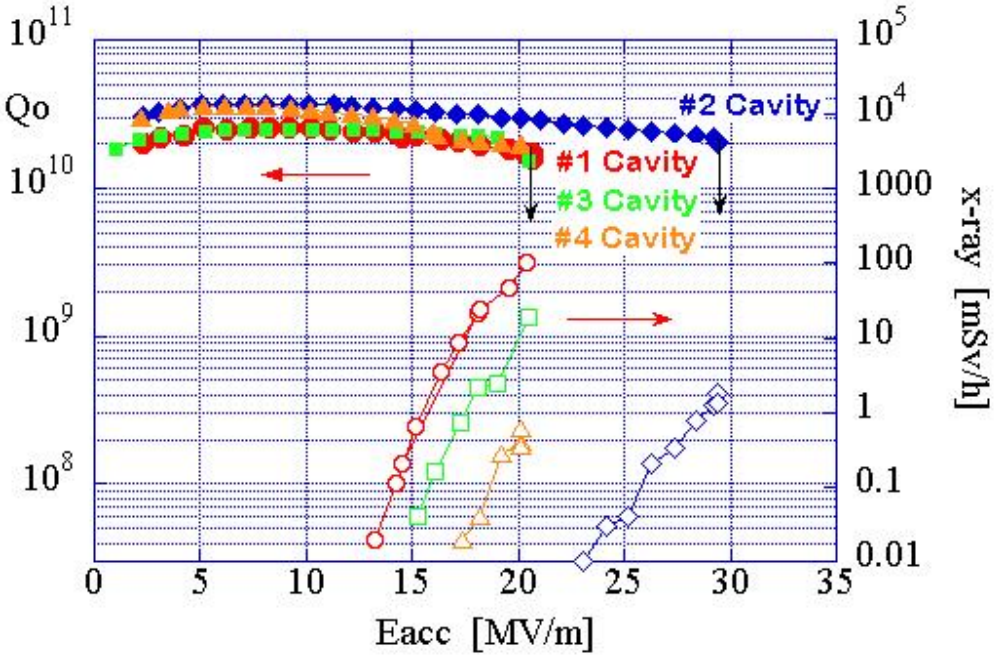
Operational Results from STF-VTS and Cryomodule Tests at KEK

Eiji Kako
(KEK, Japan)

Vertical test results of four STF-1 cavities

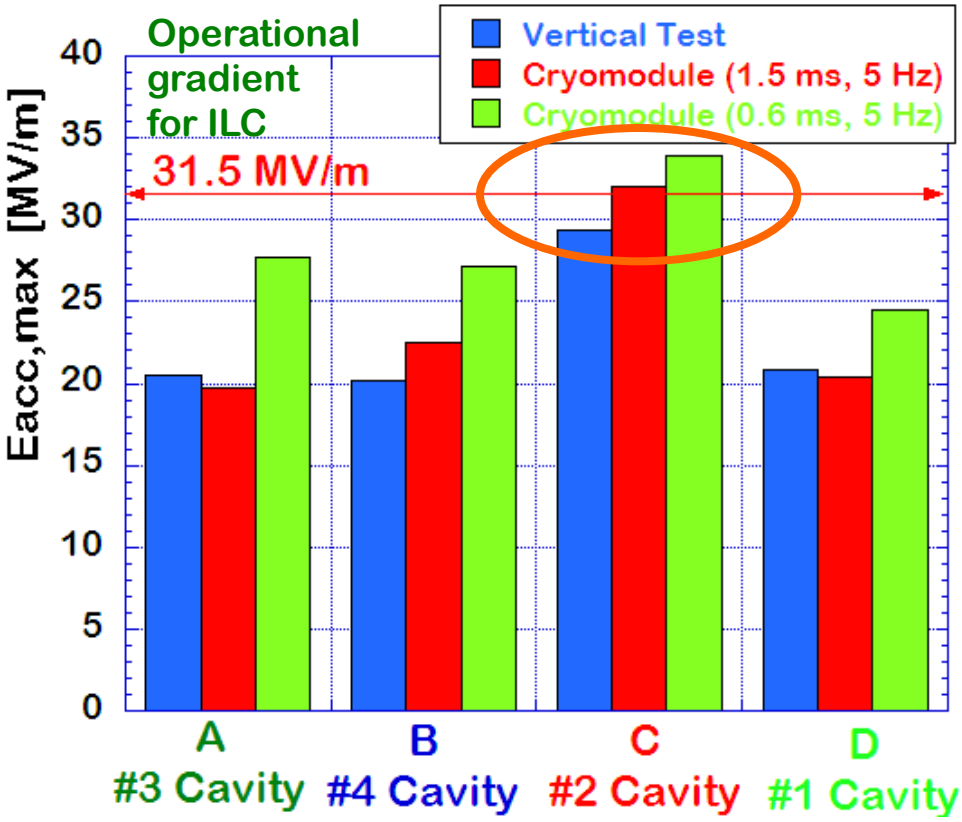
STF-1 ;
MHI-01 cavity
MHI-02 cavity
MHI-03 cavity
MHI-04 cavity

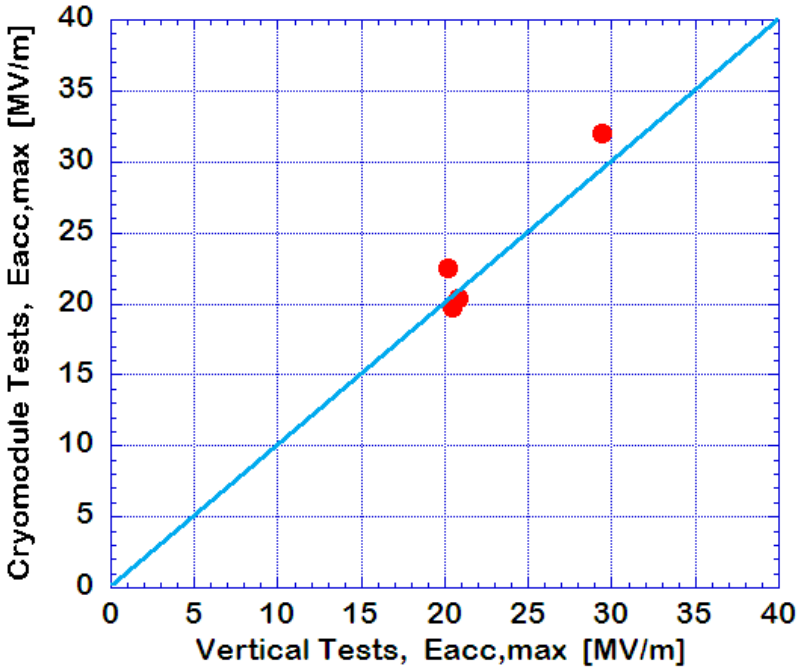




High power tests of STF-1 cryomodule in Sept.~ Dec. 2008.

High power test results in STF-1 cryomodule



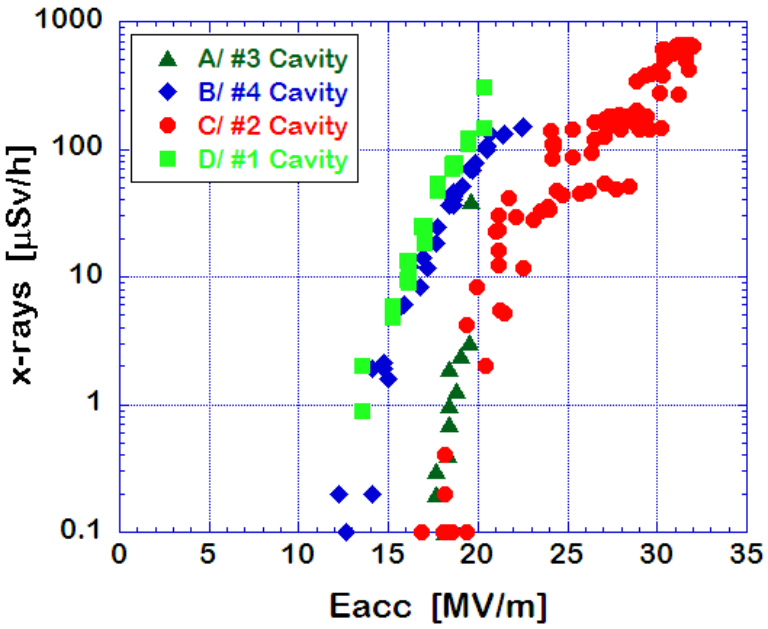


Ave. Eacc,max (V.T) = 22.7 MV/m

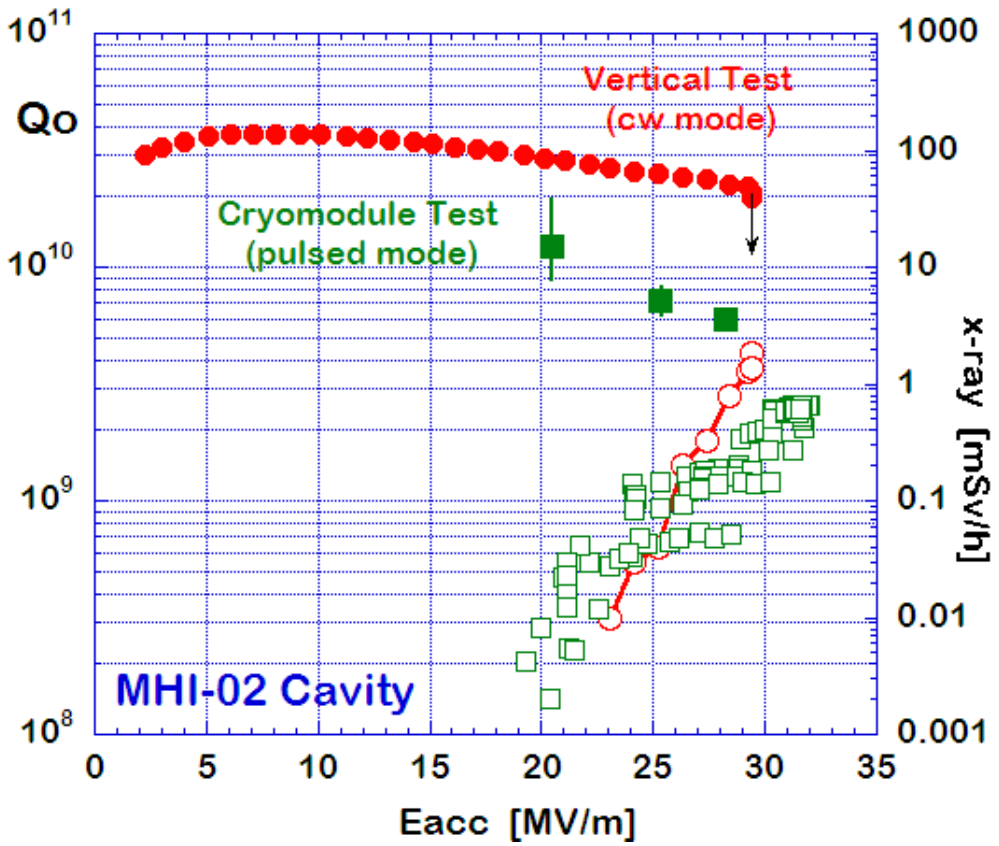
Ave. Eacc,max (C. T) = 23.7 MV/m

No degradation in Eacc,max from VT was observed in the cryomodule tests.

Comparison of Eacc,max between VT and CT

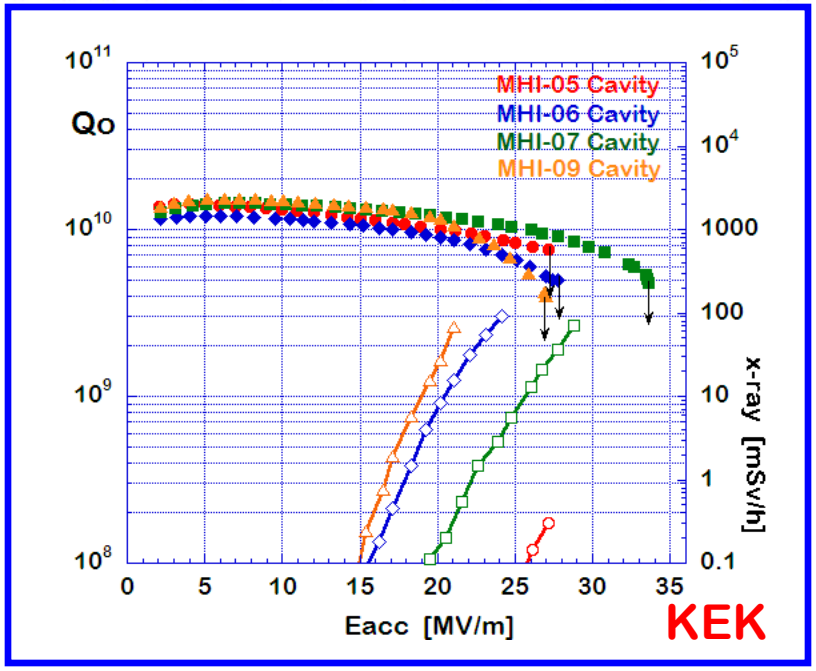


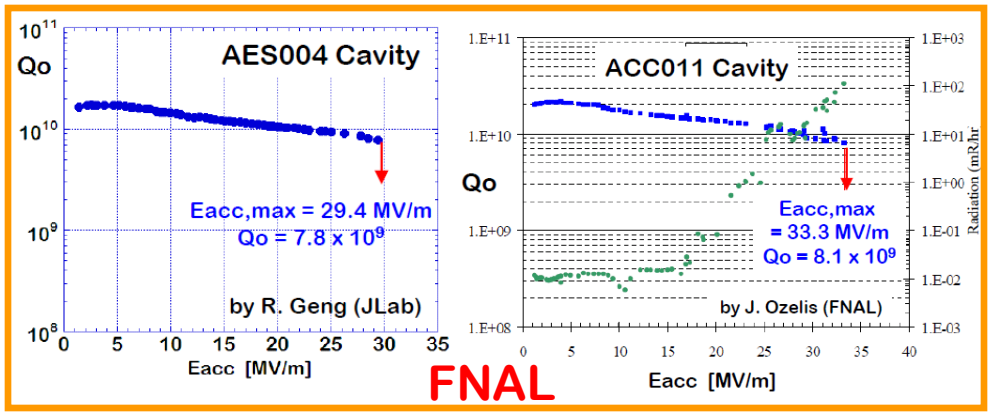
Heavy x-ray radiation due to field emission was observed with increase of Eacc.
We need more careful work in a clean room and in the tunnel to avoid dusts contamination during the assembly.

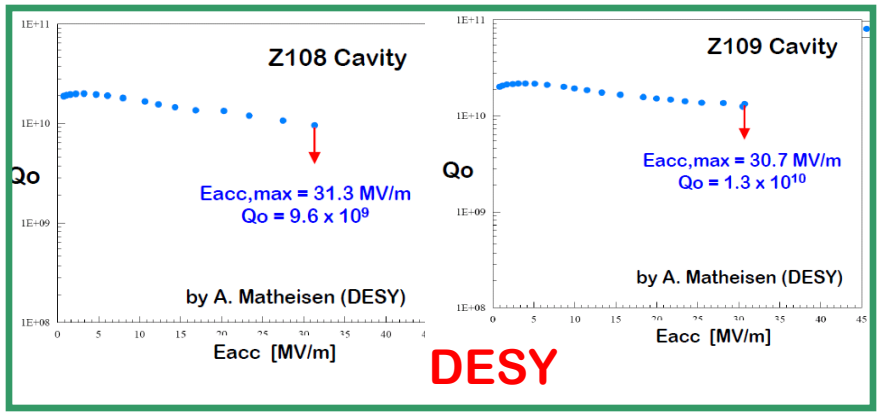


Qo drop at high gradients due to field emission was observed in the cryomodule tests.

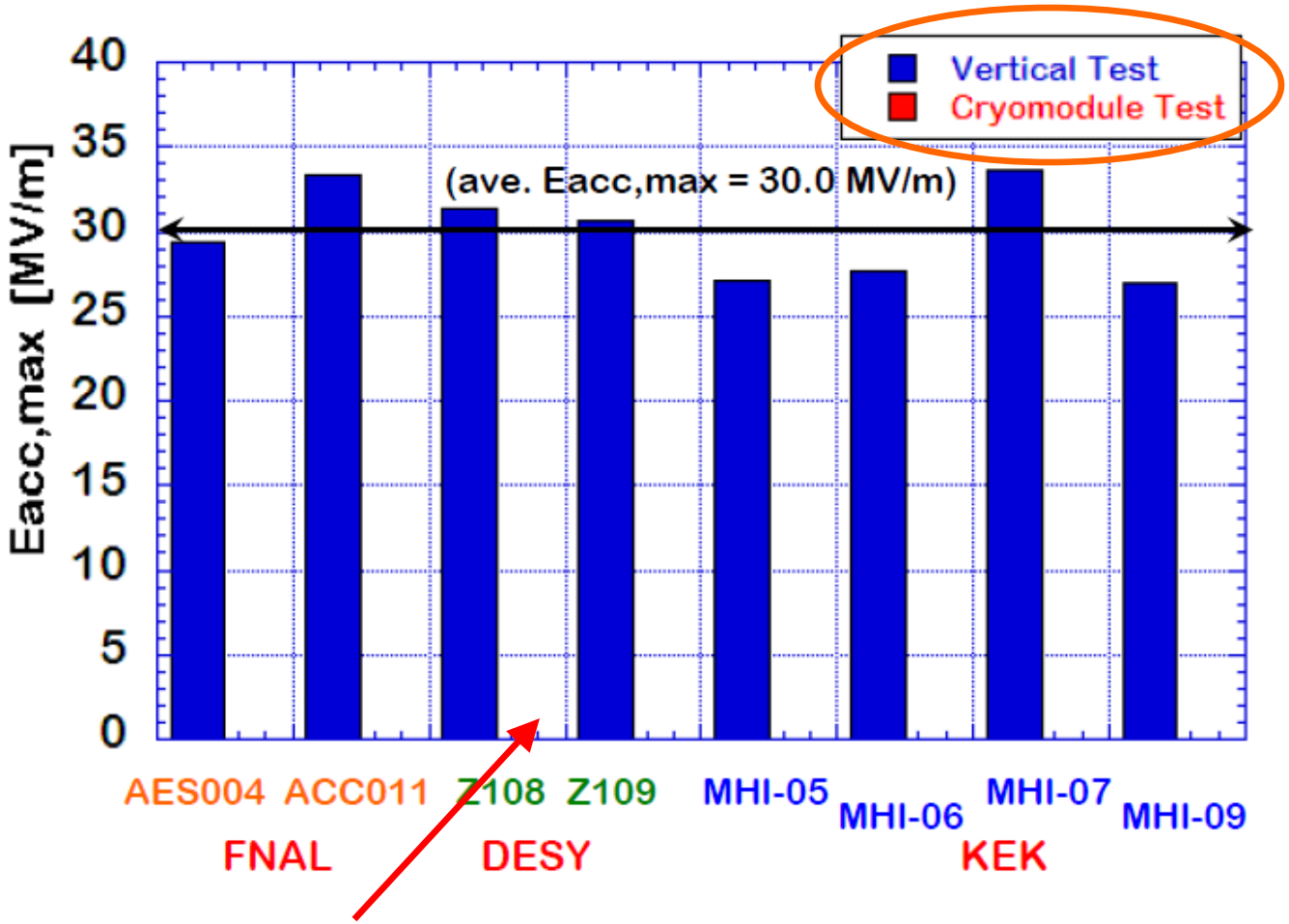
Vertical test results of eight S1-G cavities







Comparison of Eacc,max between VT and CT



High power tests of the S1-G cryomodule start very soon.
Results of achieved Eacc,max will be added in this figure.

Calibration of Q_t, Q_{HOM1}, Q_{HOM2} in S1-G

	Cavity	$Q_{t\,(CT)}$	$Q_{t\,(VT)}$	Difference	Q_{HOM1}	Q_{HOM2}
1.	C1/AES-004	6.01×10^{11}	5.9×10^{11}	+ 2%	6.08×10^{11}	2.25×10^{13}
2.	C2/ACC-011	2.48×10^{12}	2.8×10^{12}	-13%	9.45×10^{12}	4.36×10^{12}
3.	C3/Z-108	2.43×10^{11}	1.9×10^{11}	+22%	9.23×10^{11}	2.06×10^{13}
4.	C4/Z-109	3.53×10^{11}	4.0×10^{11}	-13%	4.93×10^{12}	7.22×10^{15}
5.	A1/MHI-05	2.39×10^{11}	2.2×10^{11}	+ 8%	1.90×10^{13}	3.99×10^{13}
6.	A2/MHI-06	2.83×10^{11}	3.4×10^{11}	-20%	1.53×10^{13}	6.42×10^{13}
7.	A3/MHI-07	2.31×10^{11}	2.6×10^{11}	-13%	9.27×10^{12}	6.09×10^{12}
8.	A4/MHI-09	2.50×10^{11}	1.8×10^{11}	+28%	9.96×10^{12}	8.04×10^{13}

difference of Q_t = -20 / +28 %

accuracy of Eacc = -/+ ~10 %

Q_{HOM1} , Q_{HOM2} > 1×10^{12} , OK

The cause of the difference should be investigated.
Beam calibration will be useful.

Calibration of Q_t at DESY

Module PXFEL2 cavities probe Q_t measured at vertical test and CMTB.

by D. Kostin (DESY)

N	cavity	Q_t @VT	Q_t @CMTB	
1	Z141	2.07×10^{11}	1.8×10^{12}	??
2	AC150	2.42×10^{11}	3.2×10^{11}	+32%
3	Z133	1.62×10^{11}	1.2×10^{11}	-26%
4	Z139	1.17×10^{11}	1.8×10^{11}	+53%
5	AC122	3.08×10^{11}	2.6×10^{11}	-16%
6	AC121	3.64×10^{11}	5.4×10^{11}	+48%
7	AC128	2.65×10^{11}	3.0×10^{11}	+13%
8	AC115	3.84×10^{11}	3.3×10^{11}	-14%

SUMMRY

- There was no severe degradation of the Eacc,max from V.T to C.T in four STF-1 cavities at KEK.
- Qo drop with heavy x-ray due to field emission was observed in #2 cavity at high gradients.
- More careful clean work in a clean room and in the tunnel is needed to avoid dusts contamination during the assembly.
- Results of eight cavities in S1-Global will be obtained in the end of September.