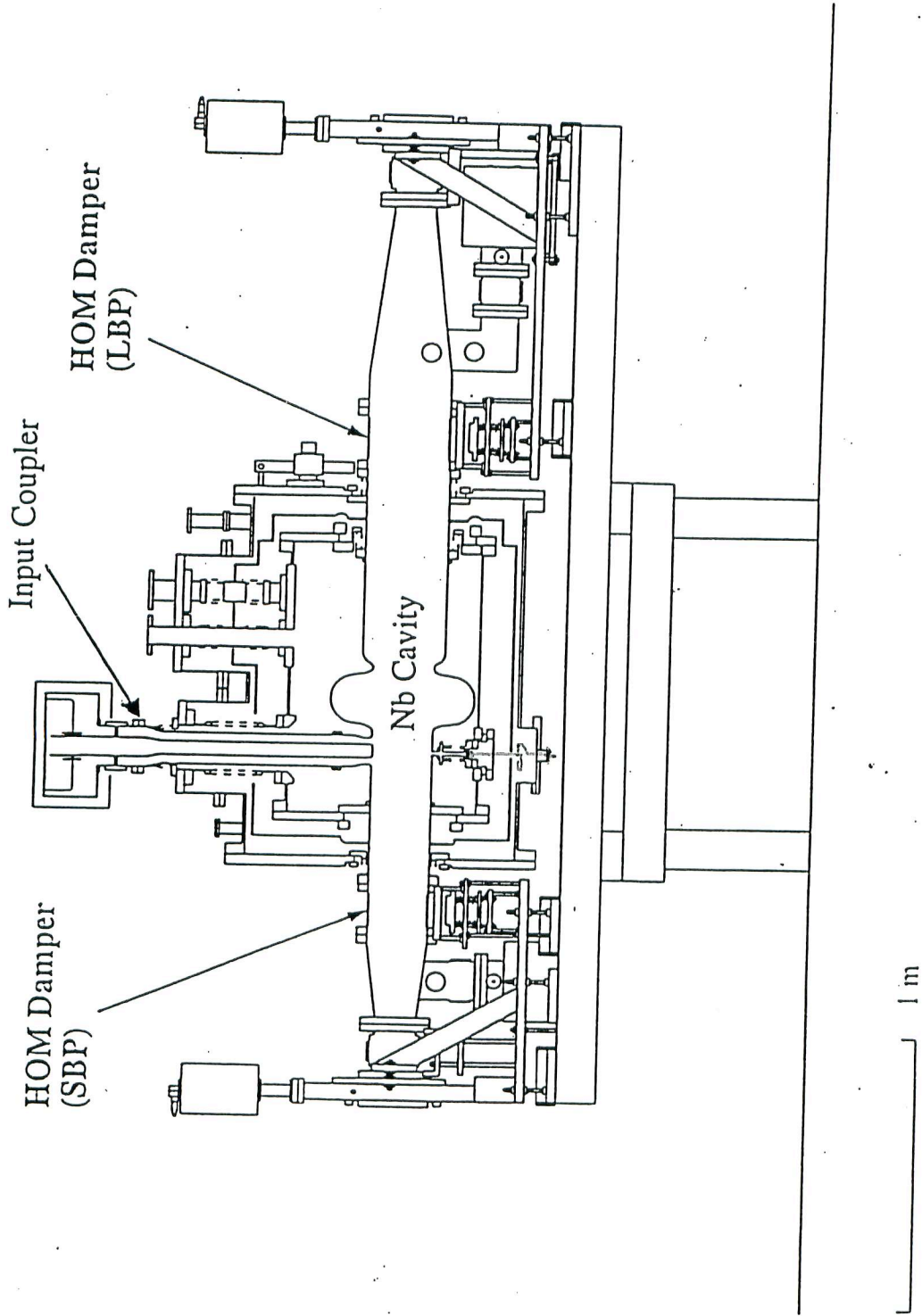


# Superconducting Cavity for KEKB

S.Mitsunobu

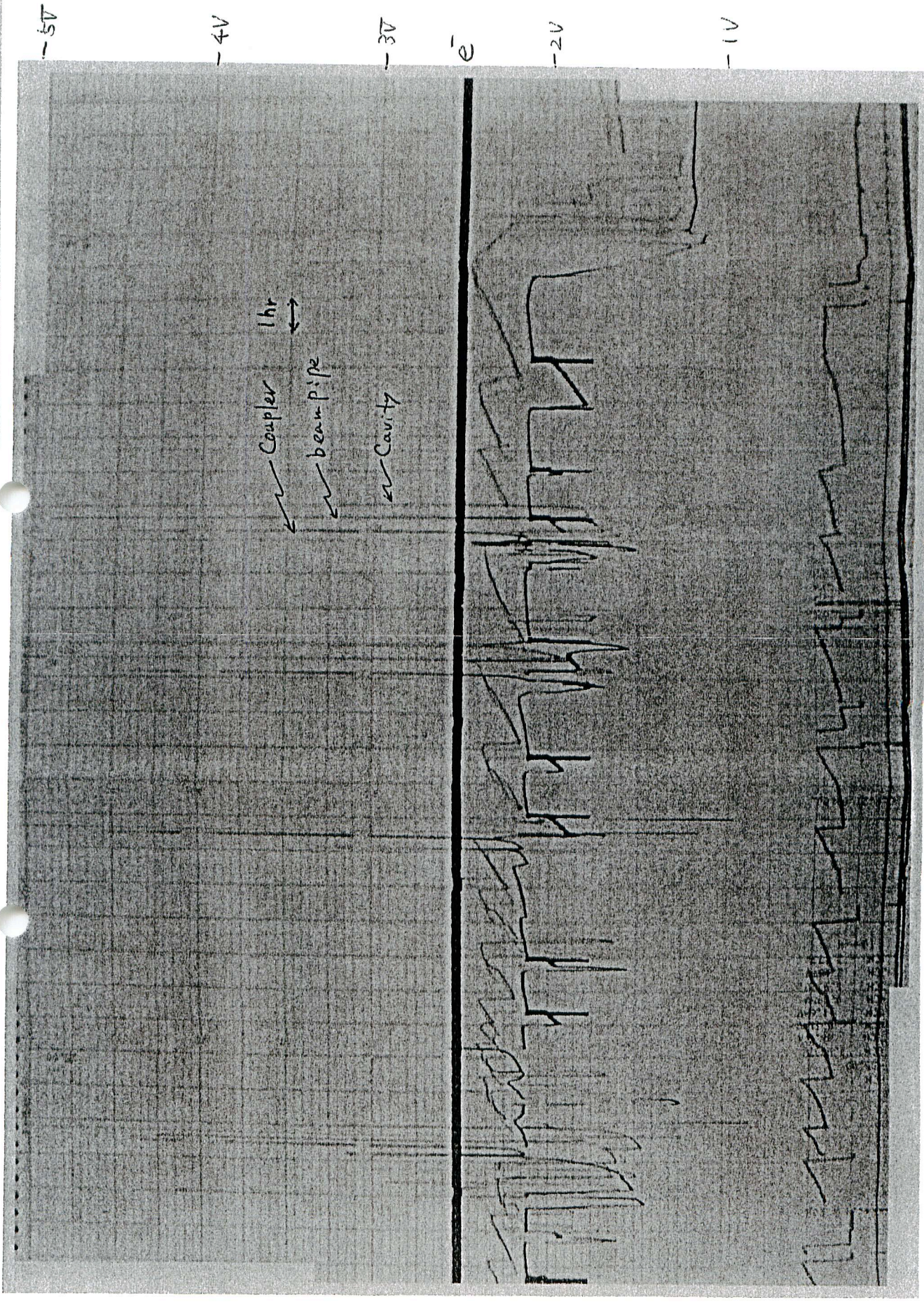
# Superconducting Cavity Module for KEKB HER



# Operation of SC Cavity

- 1998.11-2000.7 4 cavities  
2 metal gasket failure
- 2000.10-2000.10 7 cavities(8 cavities Inst.)  
1 cable failure
- 2000.10-2000.12 6 cavities(8)  
2 cable failure & 1 coupler failure
- 2001.1-2001.2 6 cavities(7)  
1 vacuum leak & 1 coupler failure





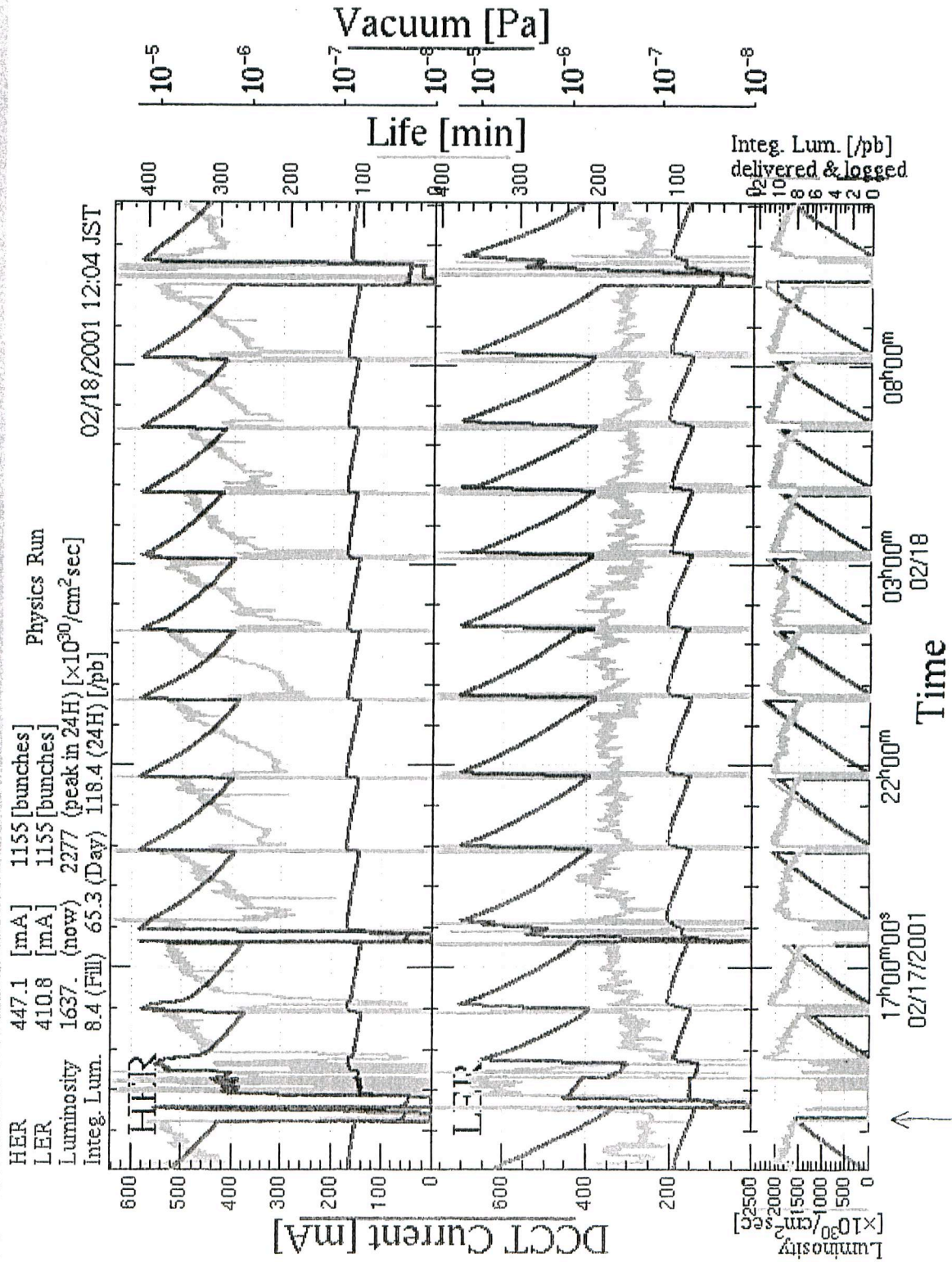
D10D Break Down at Bad Vacuum Condition



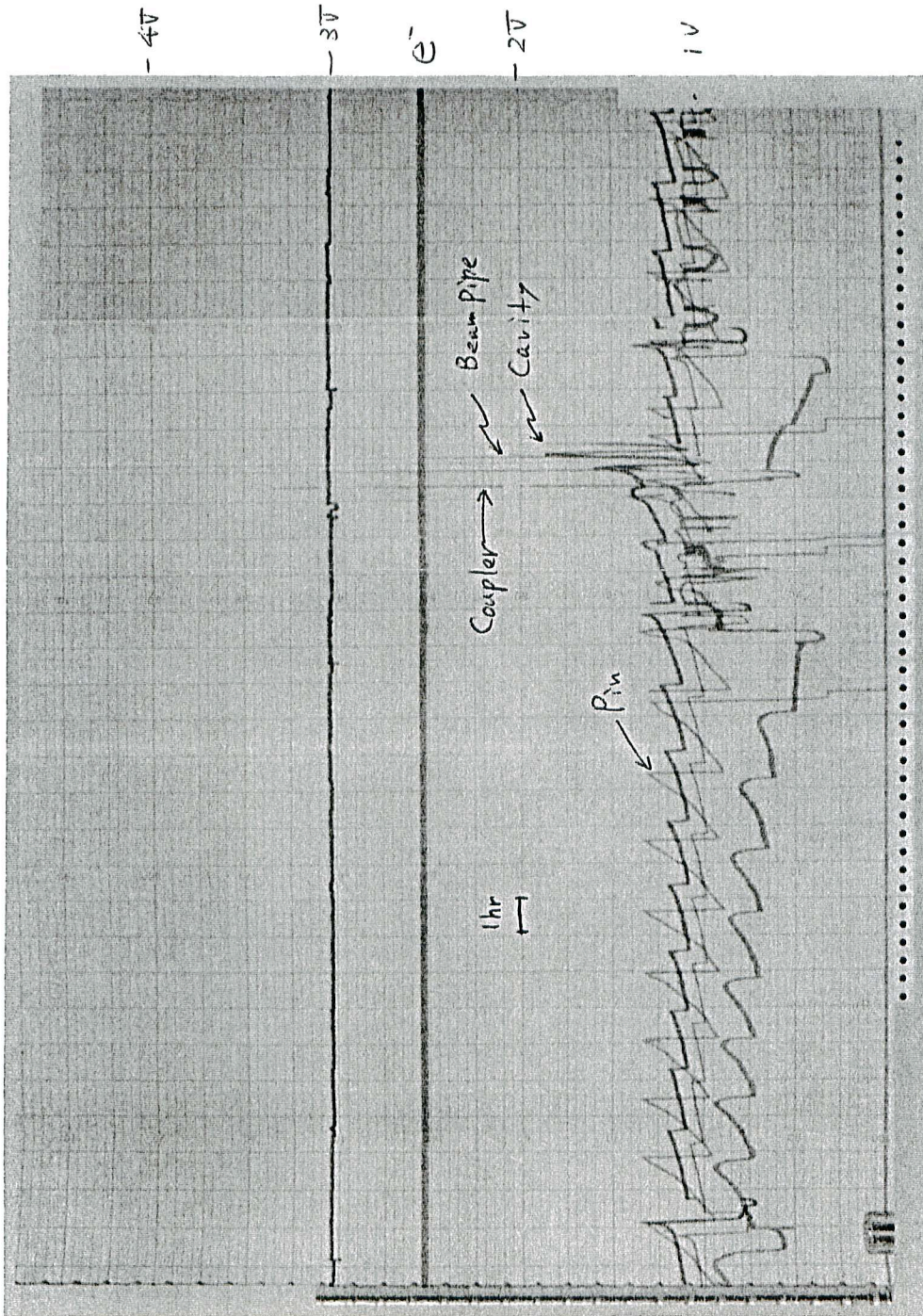
## Processing of Cavity

- Room temperature RF processing for input coupler with bias voltage
- Cavity processed with pulse modulated power
- NEG pumps reactivated every month
- Cavity processed with bias voltage if frequent trip

This graph automatically updates every other minute. Current local time is Sun Feb 18 12:04:47 JST 2001,







## D10B, Break Down



# KEKB-SCC Cavity Voltage, Vacuum & Current

D11 2001.02.18 12:40

Voltage & Current (current is zero if it is less than 3 mA)

A	B	C	D	Current
MV	MV	MV	MV	mA
1.31	1.31	1.29	1.30	567

Cavity Vacuum/CCG (0.5V=3.2x10<sup>-8</sup>Pa, 1V=9.6x10<sup>-8</sup>Pa, 2V=8.6x10<sup>-7</sup>Pa, 1Torr=133.3Pa)

A	B	C	D
V	V	V	V
0.809	0.676	0.776	0.828

Coupler Vacuum/metal gauge ("A.BBB" = "B.BB x 10<sup>-8</sup>+A Pa )

A	B	C	D
V	V	V	V
0.886	0.512	0.760	0.483

Connection Vacuum/CCG (0.5V=3.2x10<sup>-8</sup>Pa, 1V=9.6x10<sup>-8</sup>Pa, 2V=8.6x10<sup>-7</sup>Pa, 1Torr=133.3Pa)

CN0	CN1	CN2	CN3	CN4
V	V	V	V	V
0.602	0.725	0.578	0.653	0.535

Pressure units conversion table



# SCC HOM Damper Status (A, B)

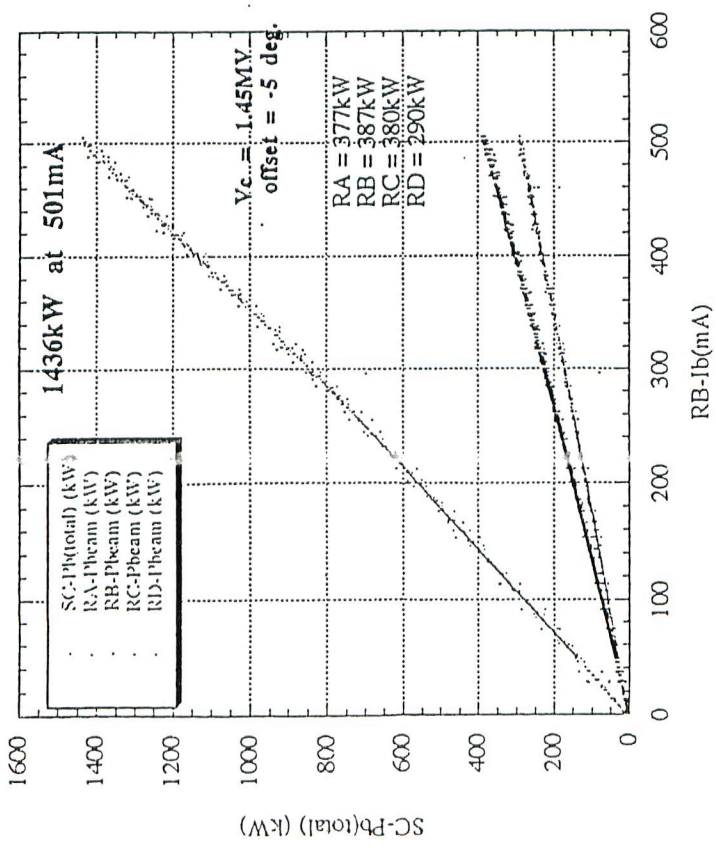
D11 2001.02.18 12.40 I=567mA

From left to right: Cavity vacuum, Water flow rate, Inlet temp., Outlet temp. and Power absorbed through damper.

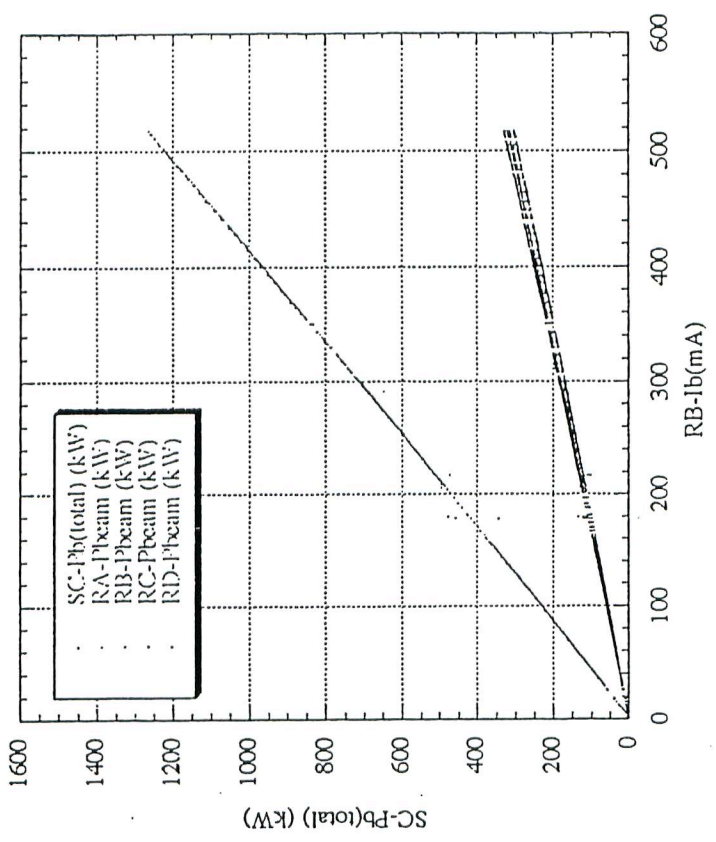
A-CCG V	A-S-Flow L/min	A-S-IN C	A-S-OUT C	A-S (kW) kW
0.812	5.00	22.20	26.13	1.37
Coupler V	A-L-Flow L/min	A-L-IN C	A-L-OUT C	A-L (kW) kW
0.836	4.90	22.14	27.97	2.00
B-CCG V	B-S-Flow L/min	B-S-IN C	B-S-OUT C	B-S (kW) kW
0.674	4.96	22.60	25.79	1.11
Coupler V	B-L-Flow L/min	B-L-IN C	B-L-OUT C	B-L (kW) kW
0.511	5.00	22.48	27.76	1.85

# KEKB-SC Ib vs Pb

990401.std311H

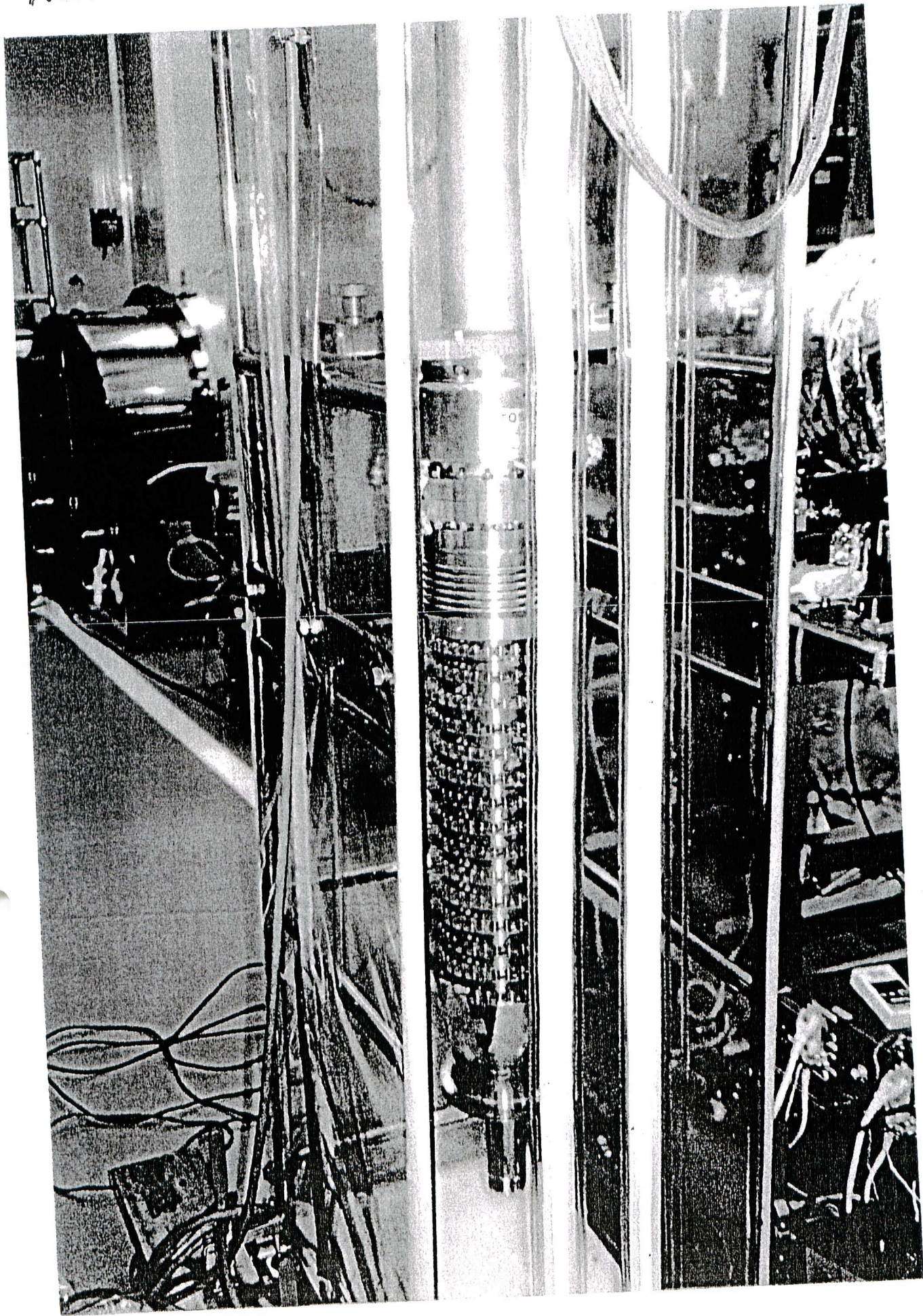


990408.std311H



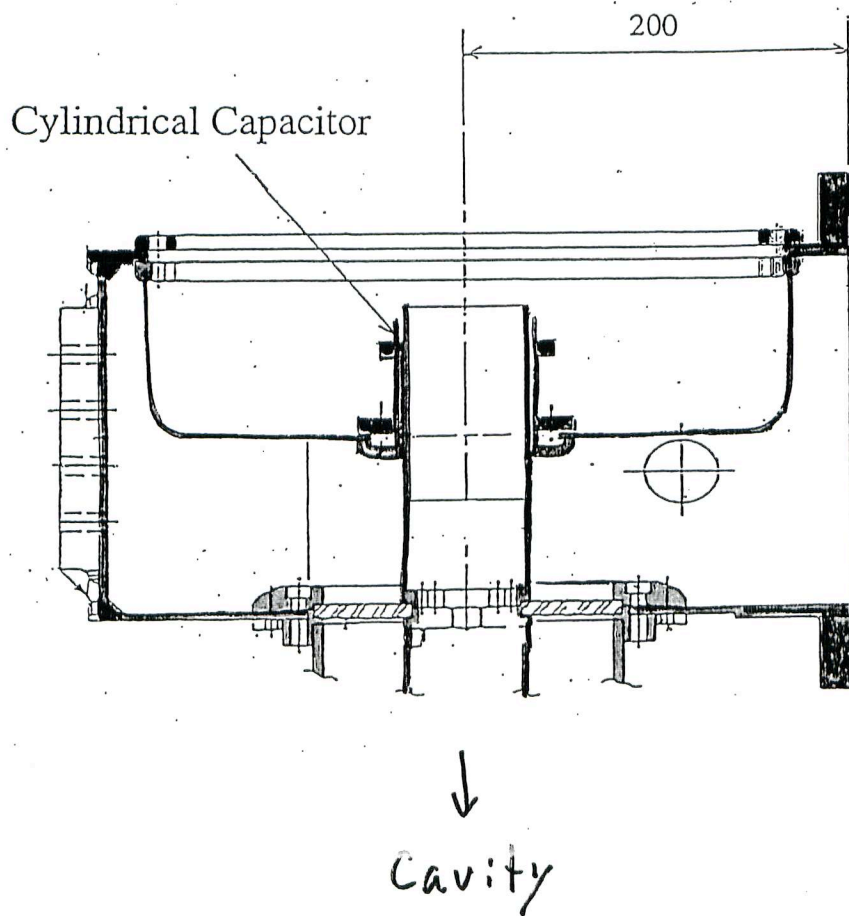


KEK INPUT COUPLER





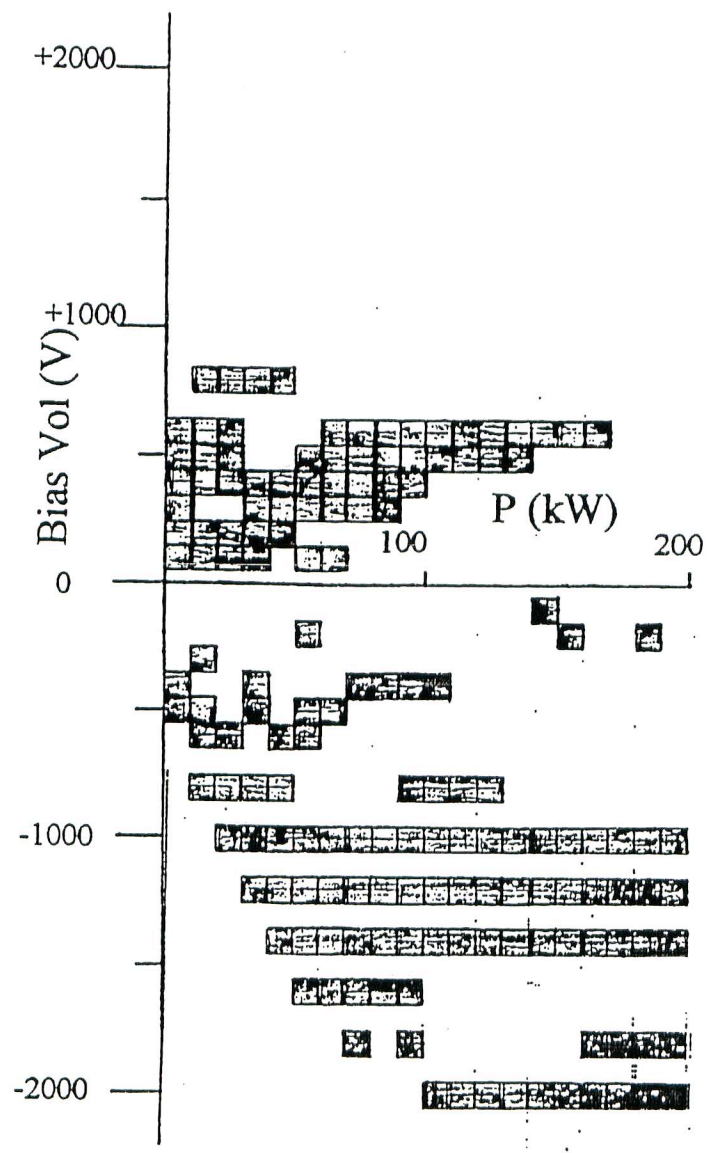
Biased Type Doorknob Transition for KEKB SC cavity



(KEK, S. Mitsunobu et al)



### Multipactor Map with DC Bias at HER



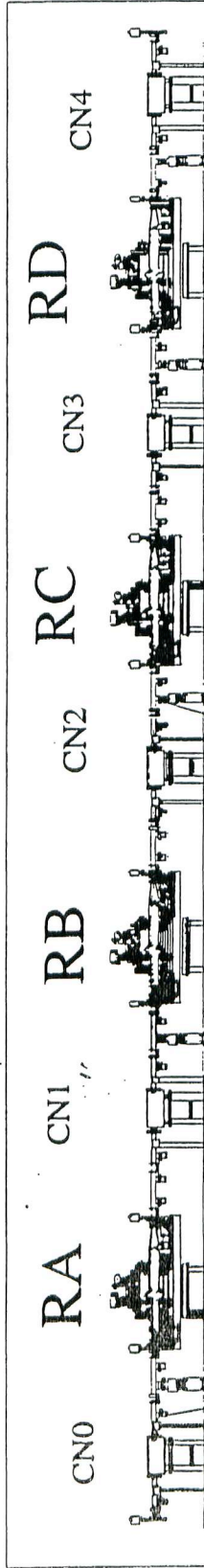


# Cavity Train and NEG Pumps

Side View



5m



NEG 400L/s  
Effective pump speed  
~77 L/s.m

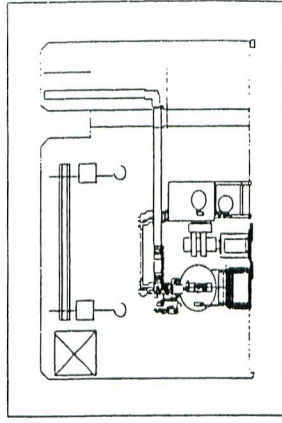
Neighbor duct

IP x1  
CCG x2  
Pirani x1  
ICF152 valve x1

Cavity

IP x2  
CCG x2  
Metal gauge x1  
Pirani x1  
Convection gauge x1  
Cavity Safety valve x1  
ICF70 All Metal Valve x3

Cross Section





## Operation summary

- Maximum Current 650 mA
- Maximum Power to Beam 380kW
- HOM power 4kw/cavity
- No Trip for good vacuum condition and a few trip/week for bad vacuum condition