

PRESENT STATUS OF THE CRAB CAVITY DEVELOPMENT

CONCEPTUAL DESIGN

FABRICATION

COLD TEST OF THE PROTOTYPE CAVITY

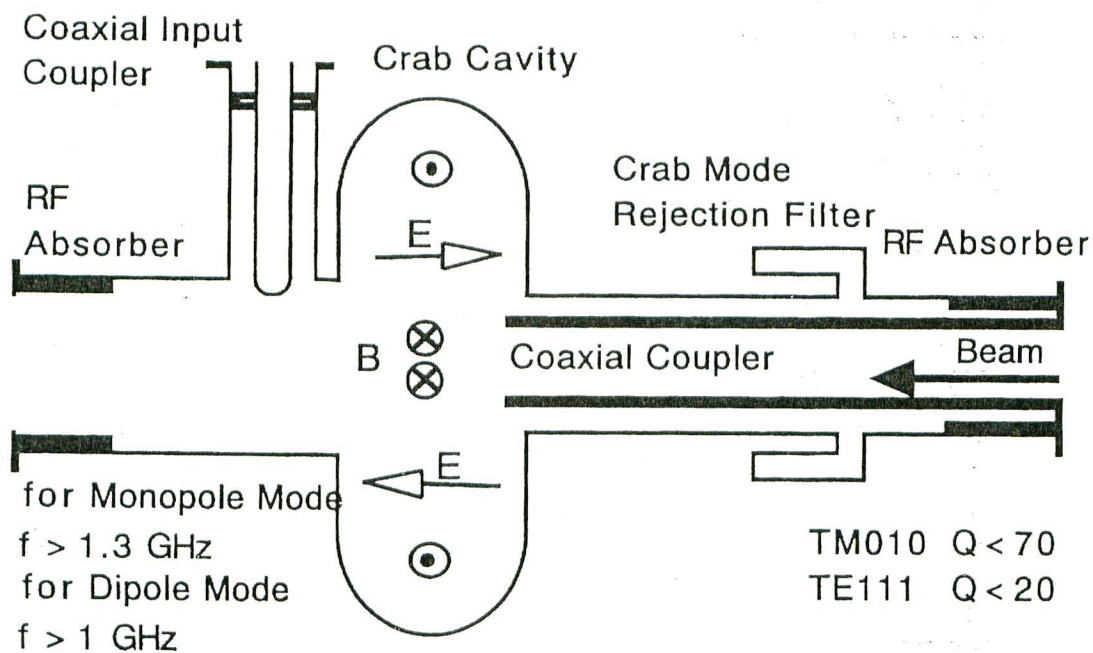
TUNING

HORIZONTAL TEST

CONCEPTUAL DESIGN

DEFLECTING VOLTAGE : 1.44 MV ($E_{sp} = 21$ MV/m)

SQUASHED STRUCTURE
CO-AXIAL BEAM PIPE
NOTCH FILTER
STUB SUPPORT



FABRICATION

CAVITY

PROTOTYPE No. 1

COLD TESTED

PROTOTYPE No. 2

FABRICATED, BARREL POLISHING

FULL SIZE Cu MODEL

INNER CONDUCTOR

MODEL CONDUCTOR No. 1

COLD TESTED

MODEL CONDUCTOR No. 2

FABRICATED

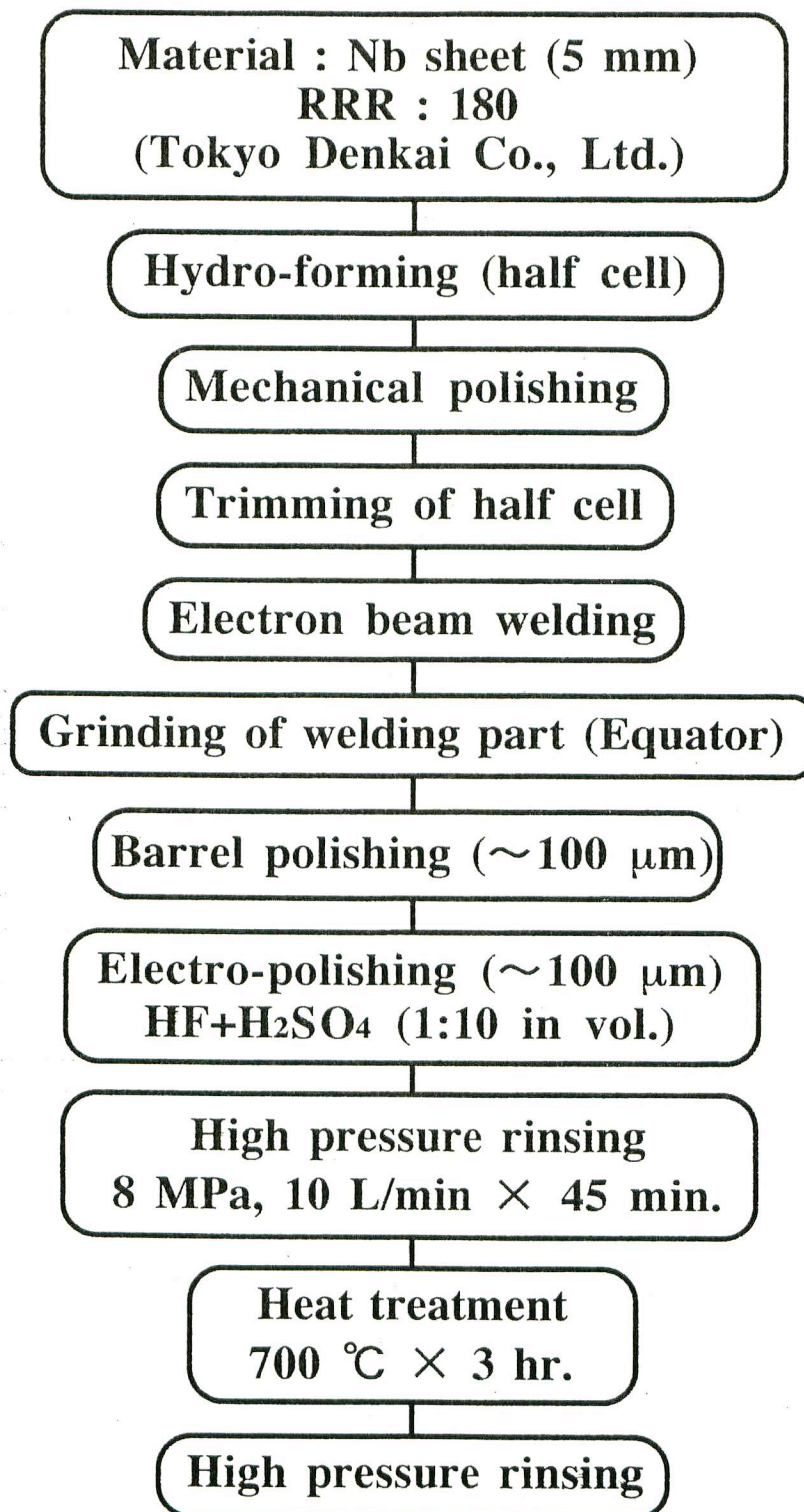
CO-AXIAL BEAM PIPE

FULL SIZE Cu MODEL

NOTCH FILTER, Cu MODEL

STUB SUPPORT, Cu MODEL

Fabrication and treatments

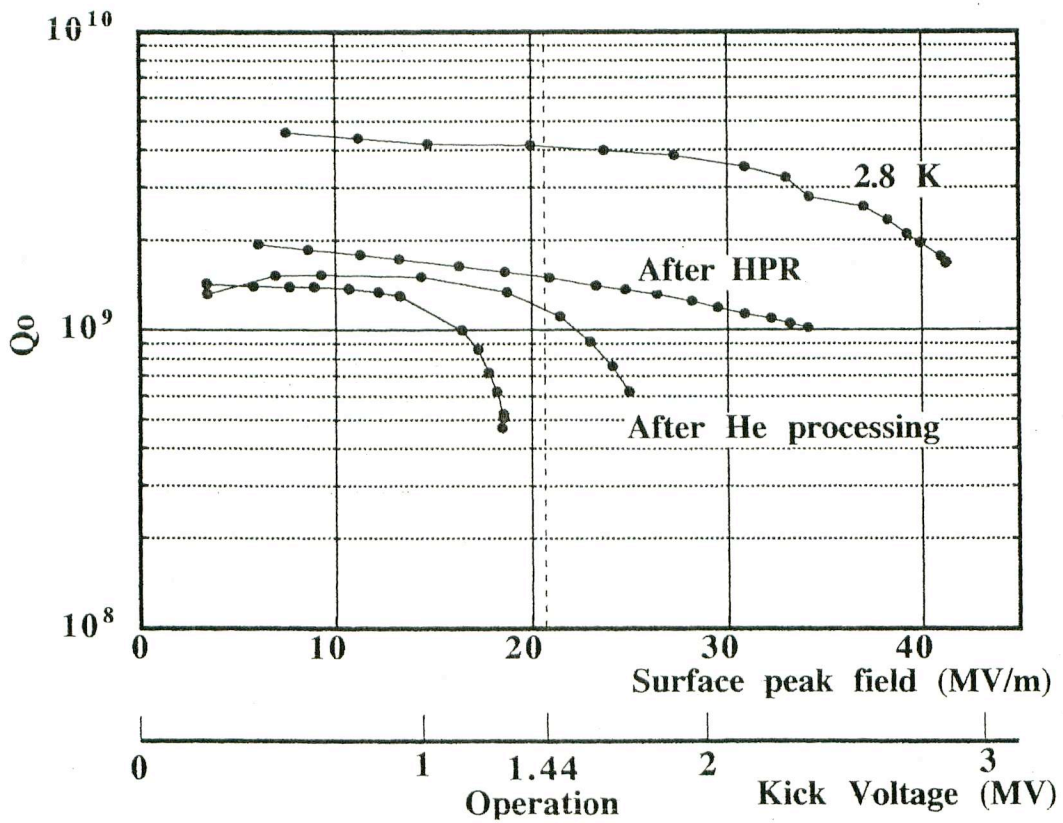


COLD TEST OF THE PROTOTYPE CAVITY

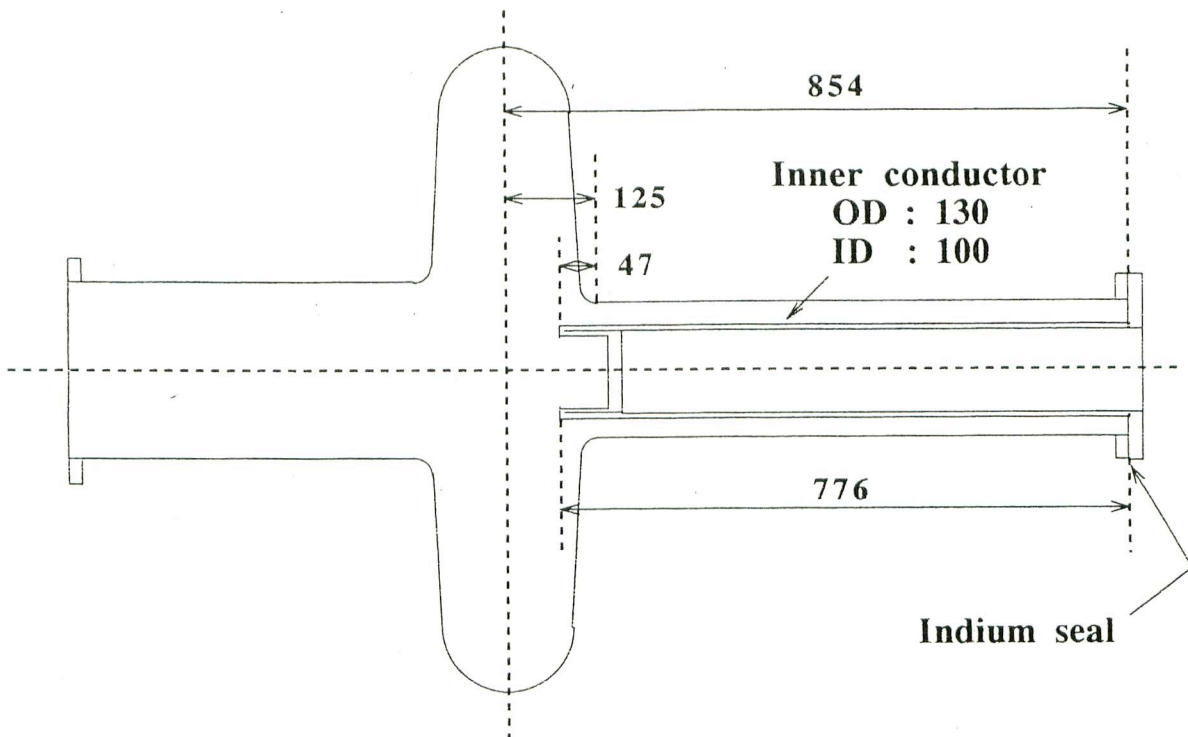
AFTER He PROCESSING : 25 MV/m

SURFACE PEAK FIELD AFTER HPR: 34 MV/m

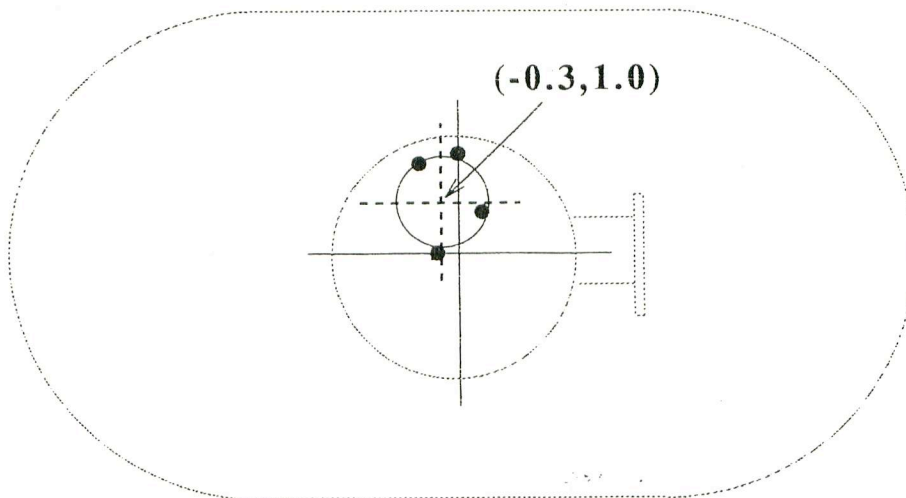
AT 2.8 K : 41 MV/m



Cavity : Prototype I



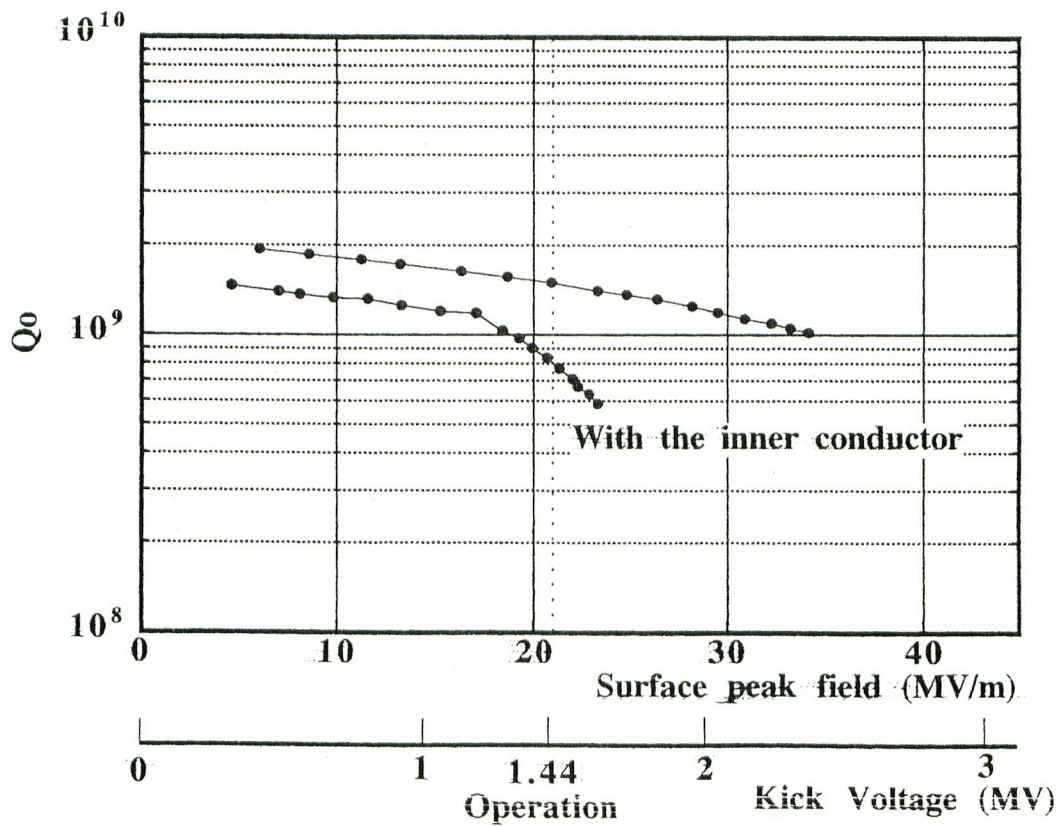
Crab cavity with the model inner conductor



Alignment

COLD TEST OF THE PROTOTYPE CAVITY

WITH THE MODEL CONDUCTOR : 23 MV/m
UNLOADED Q : DEGRADED FROM 2 TO 1.3 x 10⁹
MULTIPACTING AT LOW FIELDS
FIELD EMISSION AT 18 MV/m



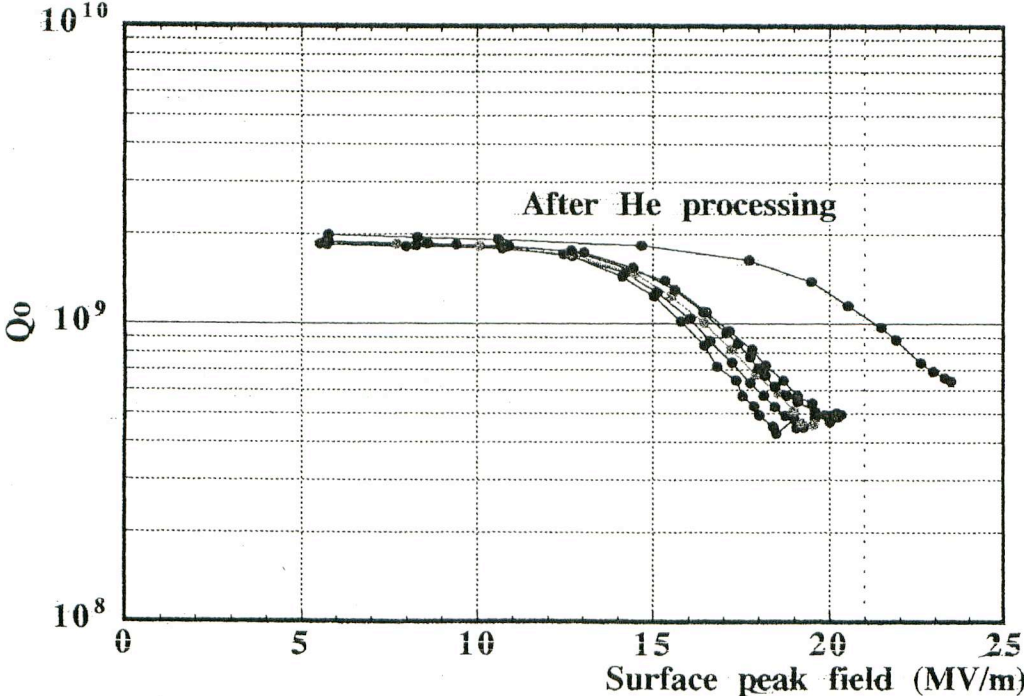
COLD TEST OF THE PROTOTYPE CAVITY

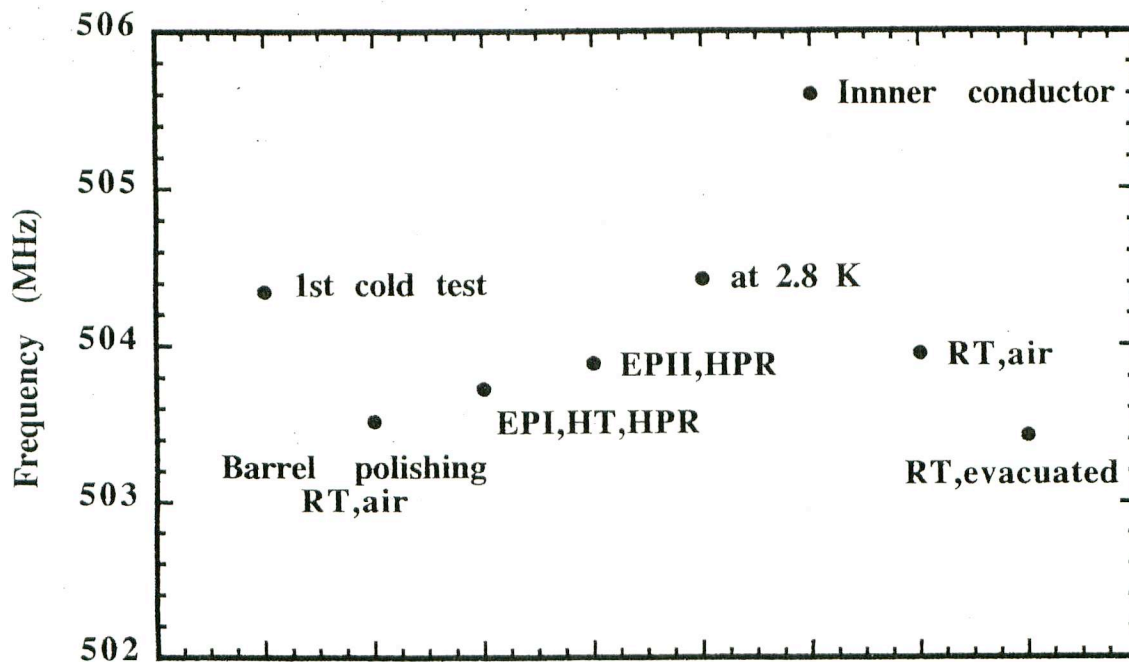
RECENT TEST

AFTER RF PROCESSING : 20 MV/m

AFTER He PROCESSING : 24 MV/m

EFFECT OF MISALIGNMENT OF THE CONDUCTOR

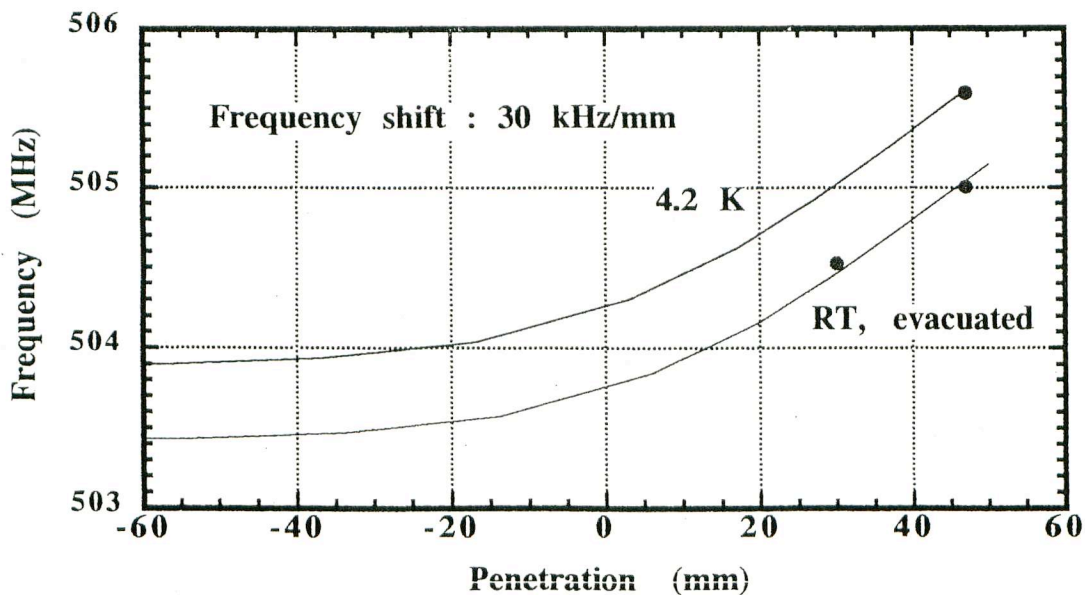




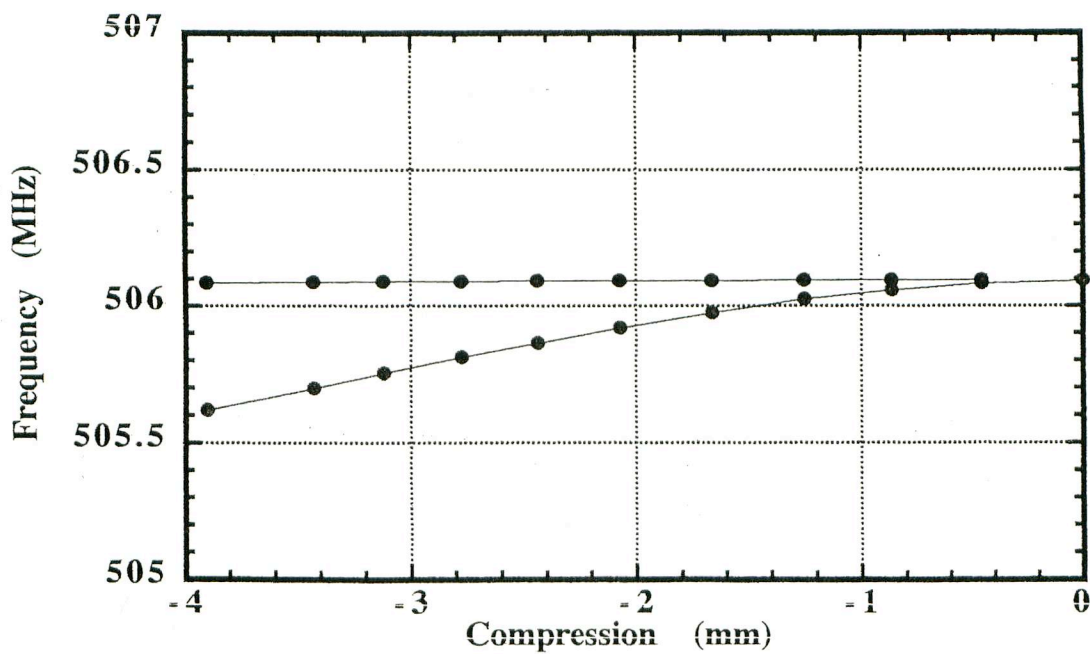
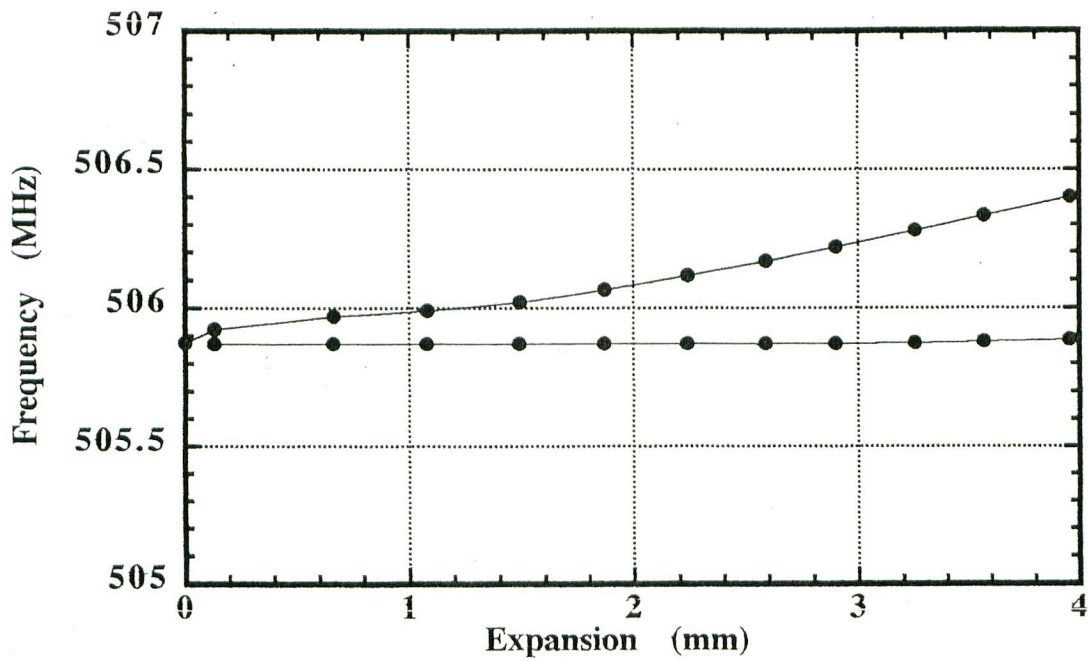
FREQUENCY SHIFT

BREAKDOWN

RT, air to RT, evacuated :	-521 kHz
RT to 4.2 K :	+460 kHz
Barrel polishing :	-887 kHz
EP+HT:	+267 kHz
at 2.8 K, saturated He :	+540 kHz
Inner conductor :	+1714 kHz



BY THE INNER CONDUCTOR



PRE-TUNING

COMPRESSION : -158 kHz/mm
EXPANSION: +153 kHz/mm
SPRING CONSTANT : 666 kg/mm

**HORIZONTAL TEST
WE ARE PREPARING AN INFRASTRUCTURE FOR THE
HORIZONTAL TEST**

**CLEAN ROOM
CRYOSTAT**

CONCLUSIONS

**FABRICATION METHOD AND SURFACE TREATMENTS
ARE ESTABLISHED FOR THE SQUASHED CELL**

**THE MODEL INNER CONDUCTOR WAS COLD TESTED
WITHOUT SERIOUS MULTIPACTING**

**LOW TEMPERATURE OPERATION IS AN OPTION FOR
HIGH FIELDS**