

DEVELOPMENT PROPOSAL OF **AN ACCELERATOR FOR NUCLEAR TRANSMUTATION**

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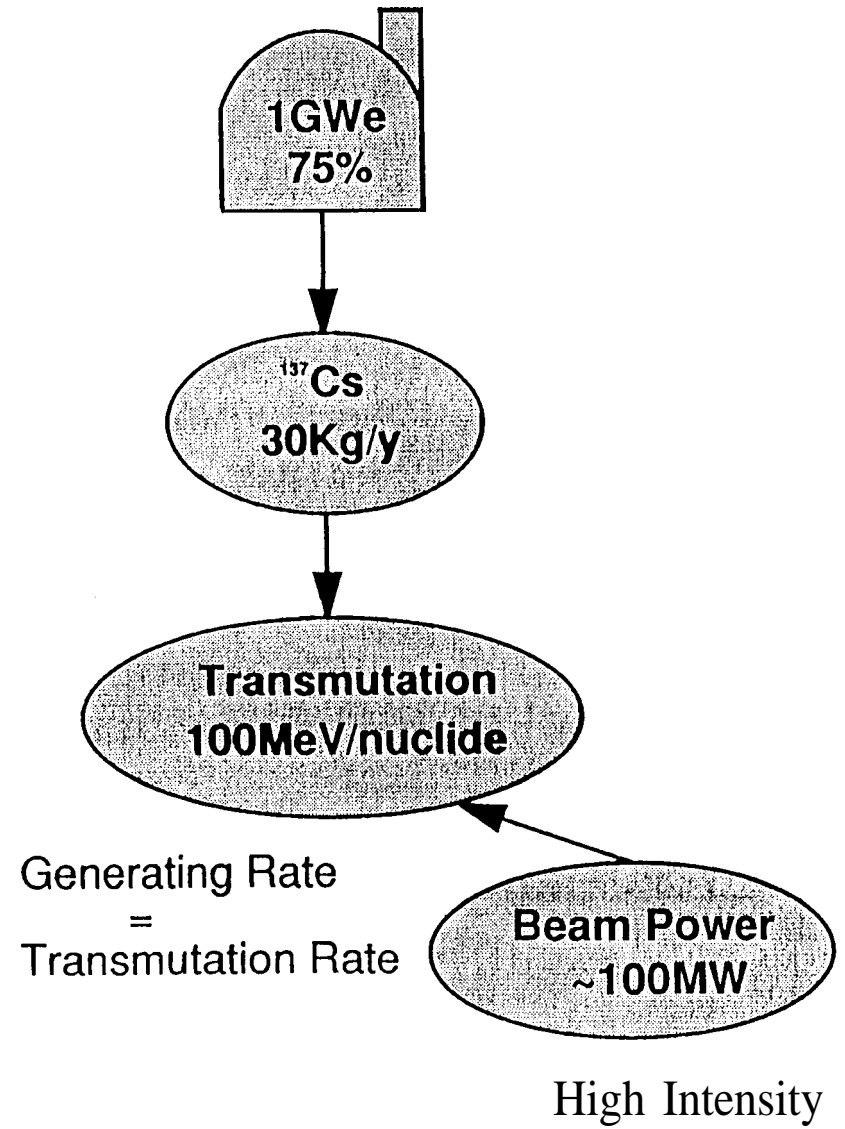
1. Transmutation of Fission Products
2. Beam Power for Transmutation
3. Test Linear Accelerator R&D
4. Recent Progress
 - Klystron
 - Accelerating System
5. Schedule

Nuclides

- Long Life
- Large Fission Yield
- Small Neutron Capture Cross Section

nuclide	half life (Y)	fission yield (%)	(n, γ) cross section
Kr	11	0.3	1.7b
" %	29	5.9	1.4mb
⁹³ Zr	1.5 x 10 ⁶	6.4	1.3-4b
⁹⁵ Tc	2.1 x 10 ⁵	6.1	20b
¹⁰⁷ Pd	6.5 x 10 ⁶	0.2	1.8b
¹³¹ I	2.3 x 10 ⁶	6.7	8.7b
¹³⁷ Cs	30	6.2	0.25b

530

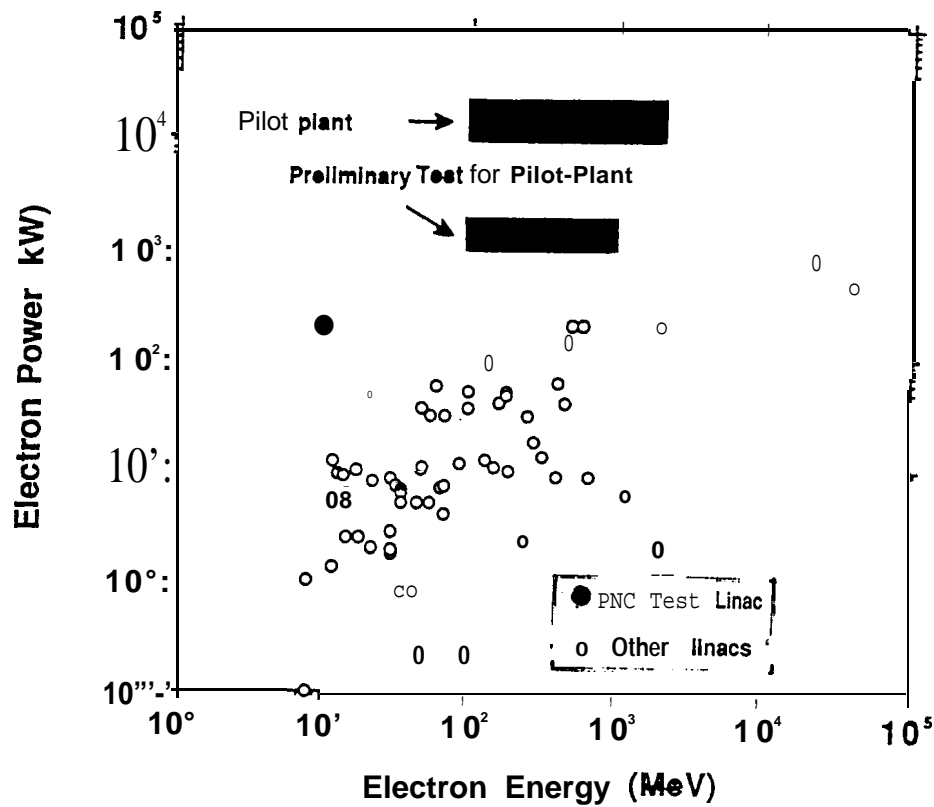


10 MeV - 100mA, Duty 20 %(CW)

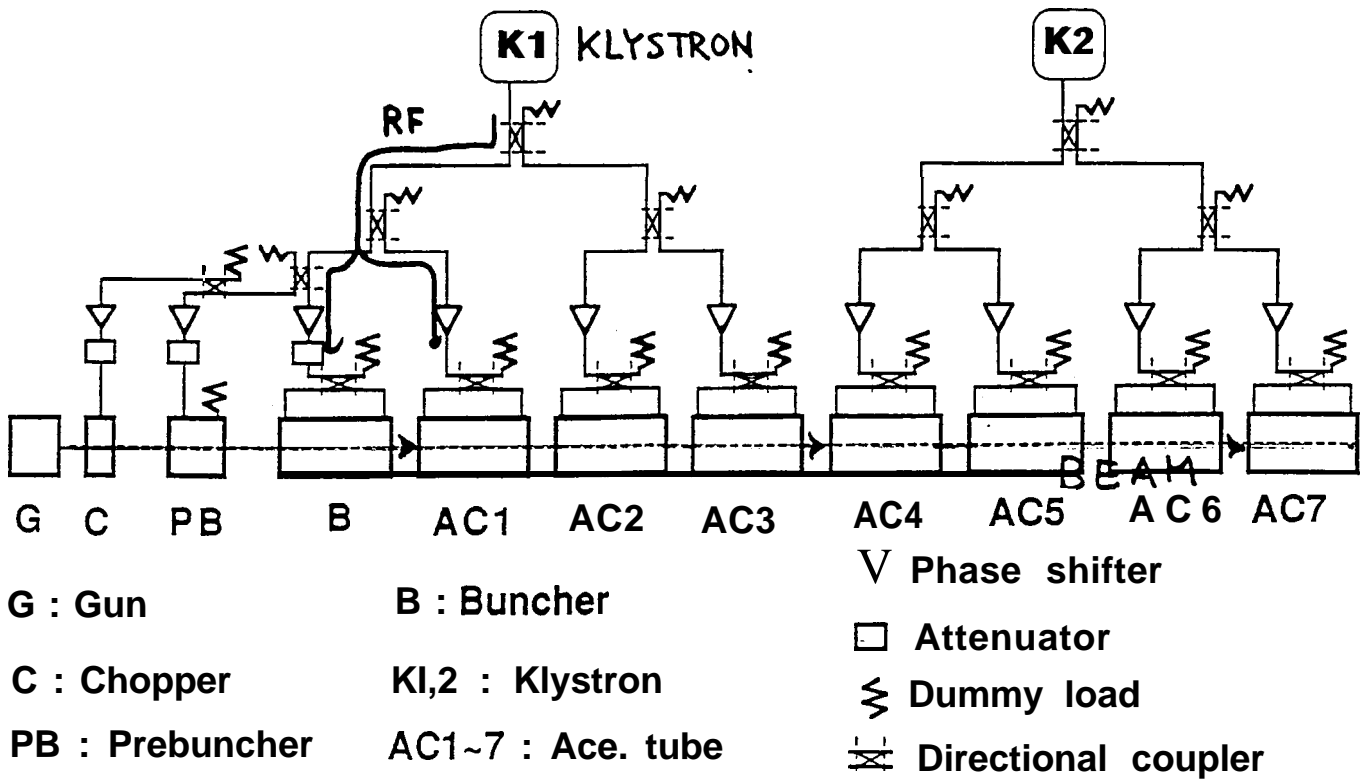
Electron Accelerator

- High Intensity Acceleration
Beam Break Up
- Energy saving
- Study for further Facility

Map of Electron Linacs



Block Diagram of PNC Test Linac



Major R&D Items

High Power Radio Frequency System

- Klystron

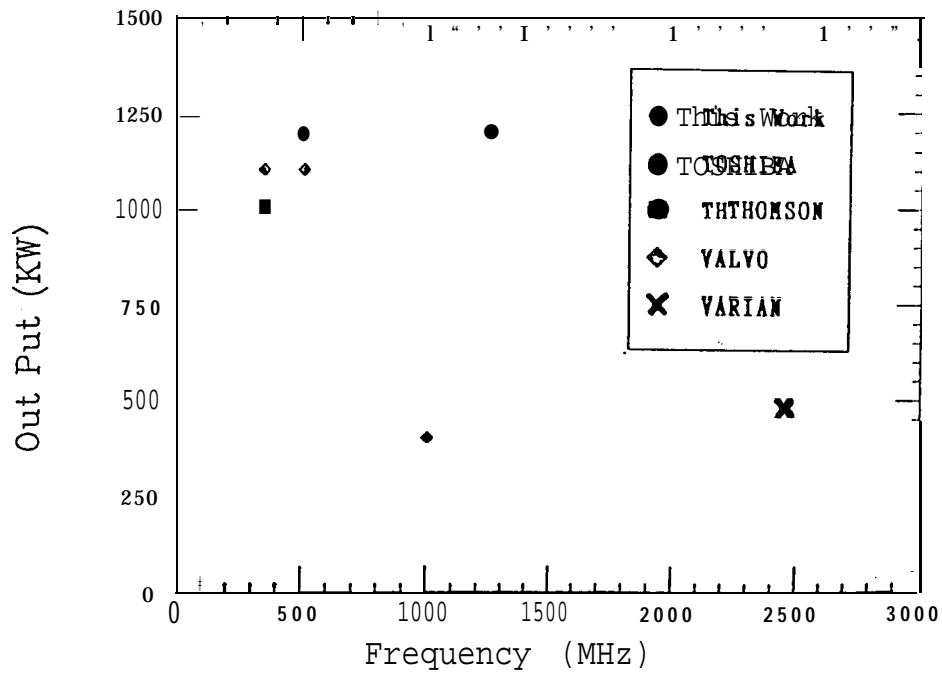
Accelerating System for High Current

- Beam Dynamics

- Cooling and Thermal Stress

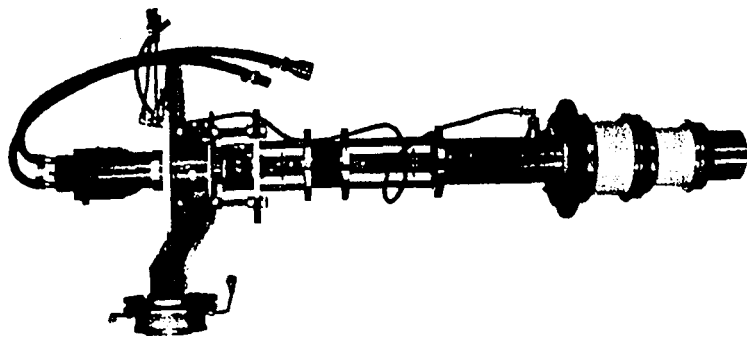
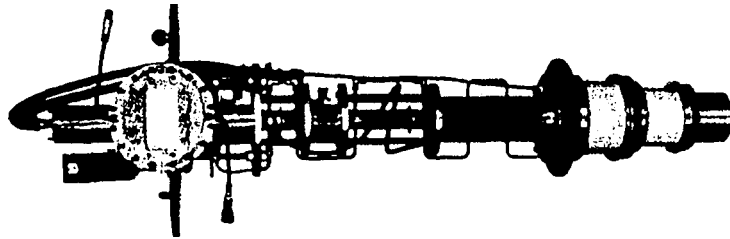
- Analysis

- High Power (1 .2MW)
- C W
- L-band (1 .249GHz)
- High Efficiency (>65%)



Model Test 1 (1989- 1990)

- Optimization of Cavity Arrangement
- Determination of Gun Parameter
- Available to 90 KV(CW Mode) and 147KV(High Power Mode) Operation
- Short Pulse Test Tube



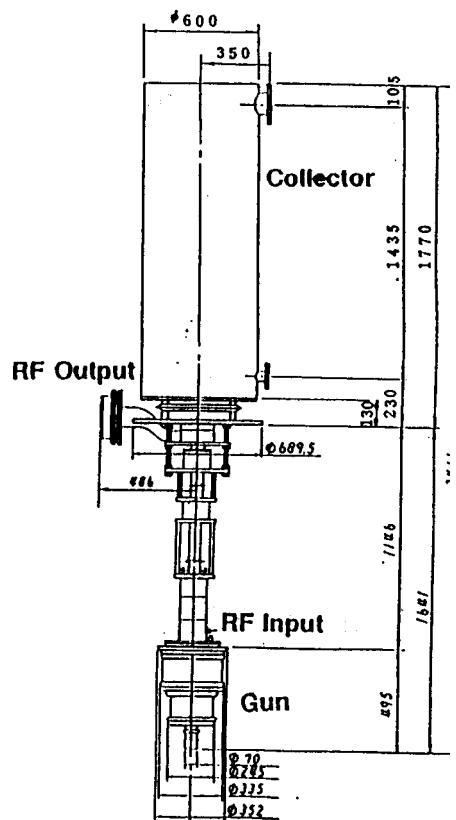
Model Test 2 (1989-)

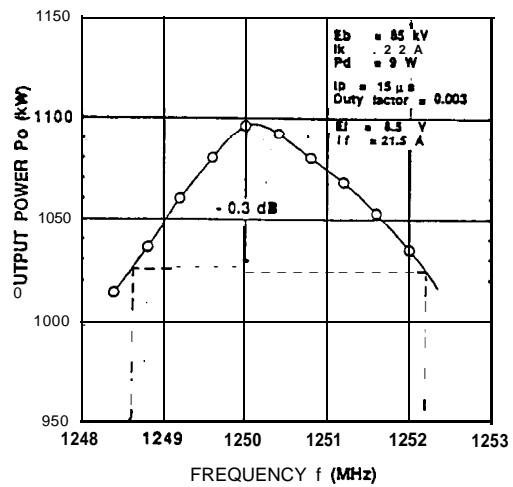
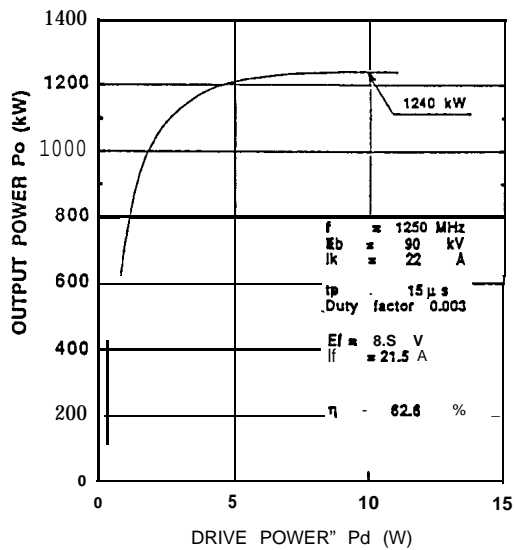
“Selection of Material for Heavy Duty

•Cooling Test of Collector

● CW Klystron

(1.2MW, 1.249GHZ, >65%)

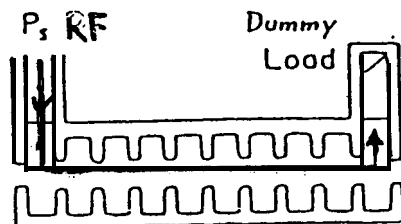




INSTANTANEOUS BANDWIDTH

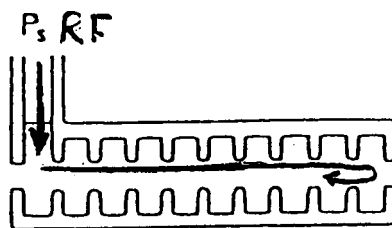
TRANSFER CHARACTERISTICS

Accelerator Structure Traveling Wave



Acc. tube

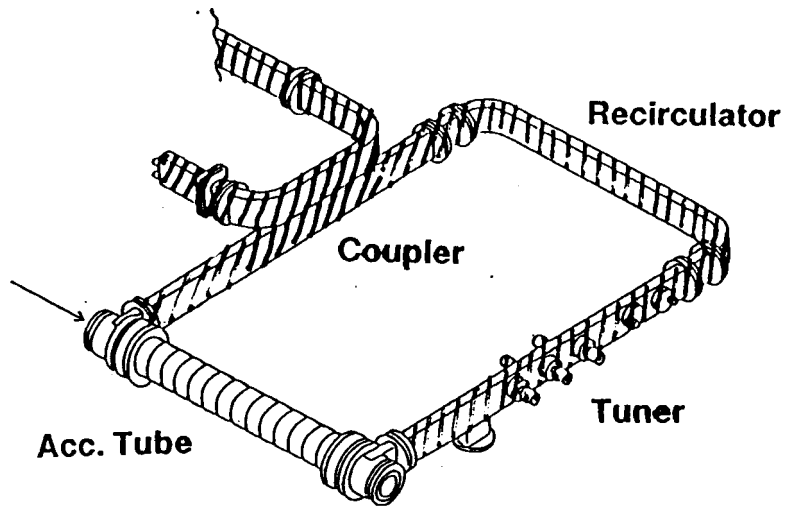
Standing Wave



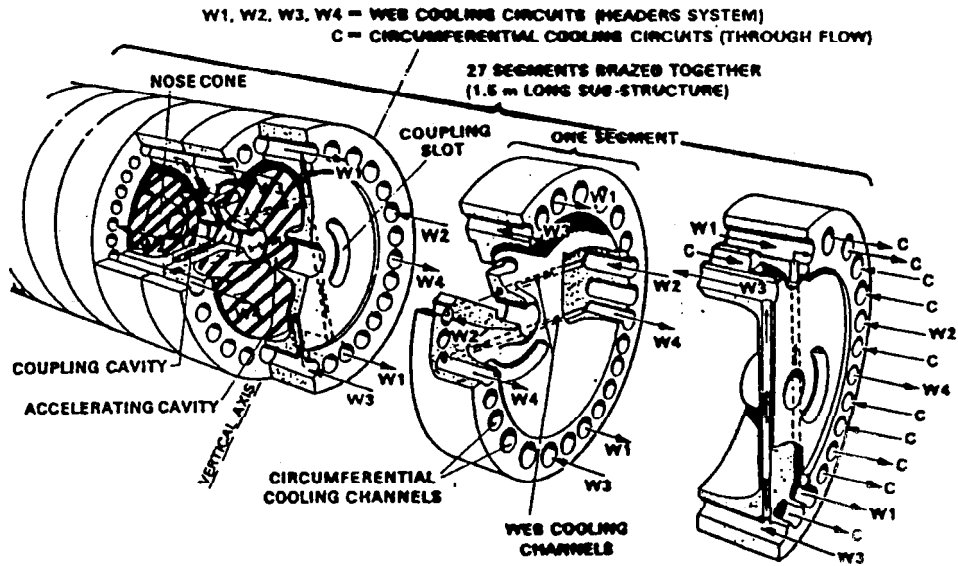
Acc. tube

Examples

Traveling Wave

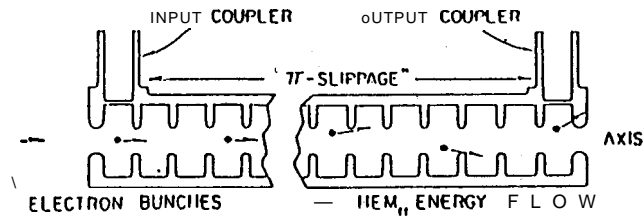


Standing Wave

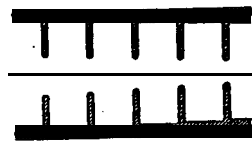


Beam Dynamics

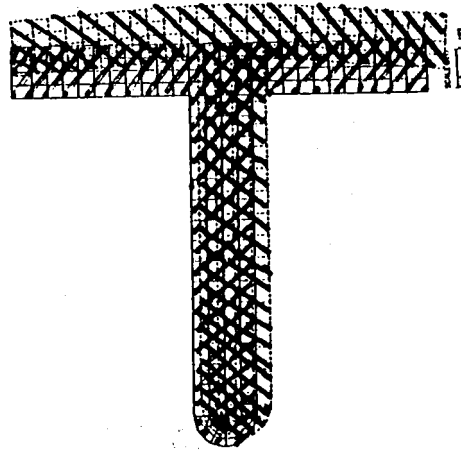
Beam Instability on High Current



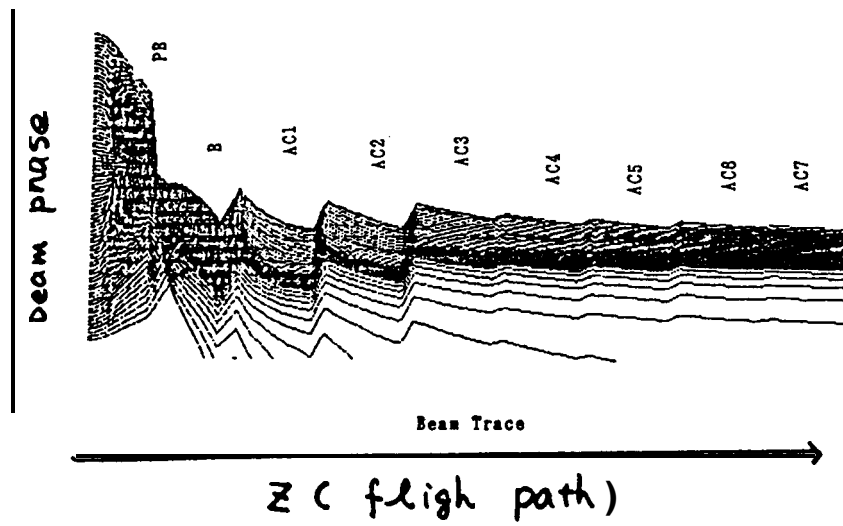
Cooling and Thermal Stress Analysis



Acc. Tube

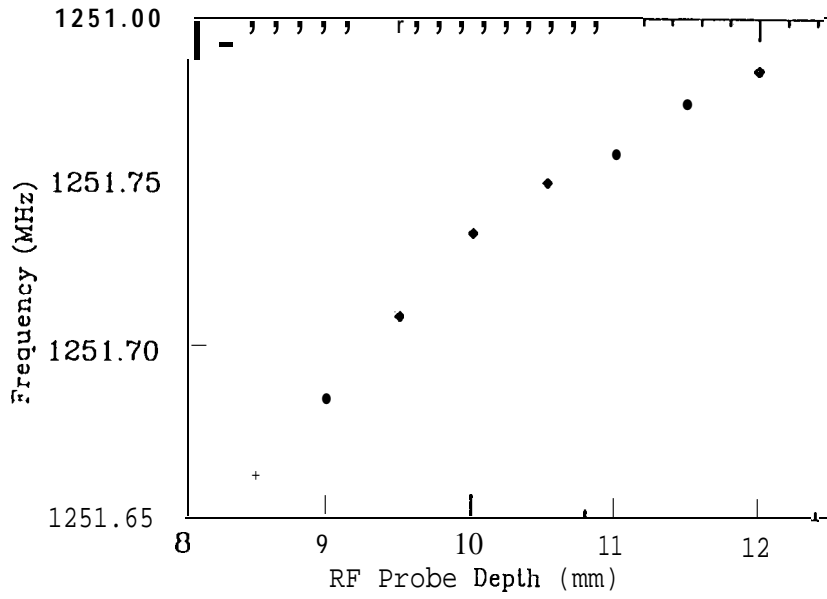


Beam Dynamics Code Analysis

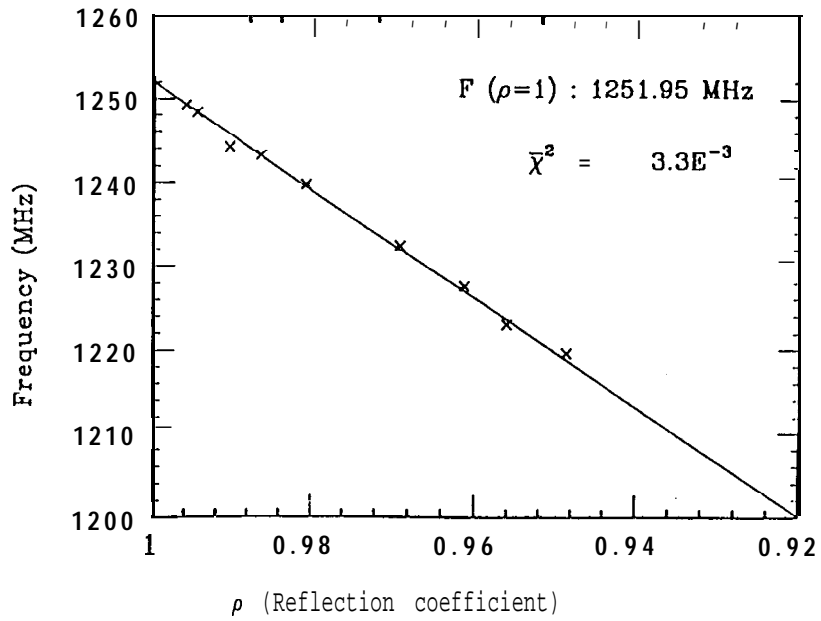


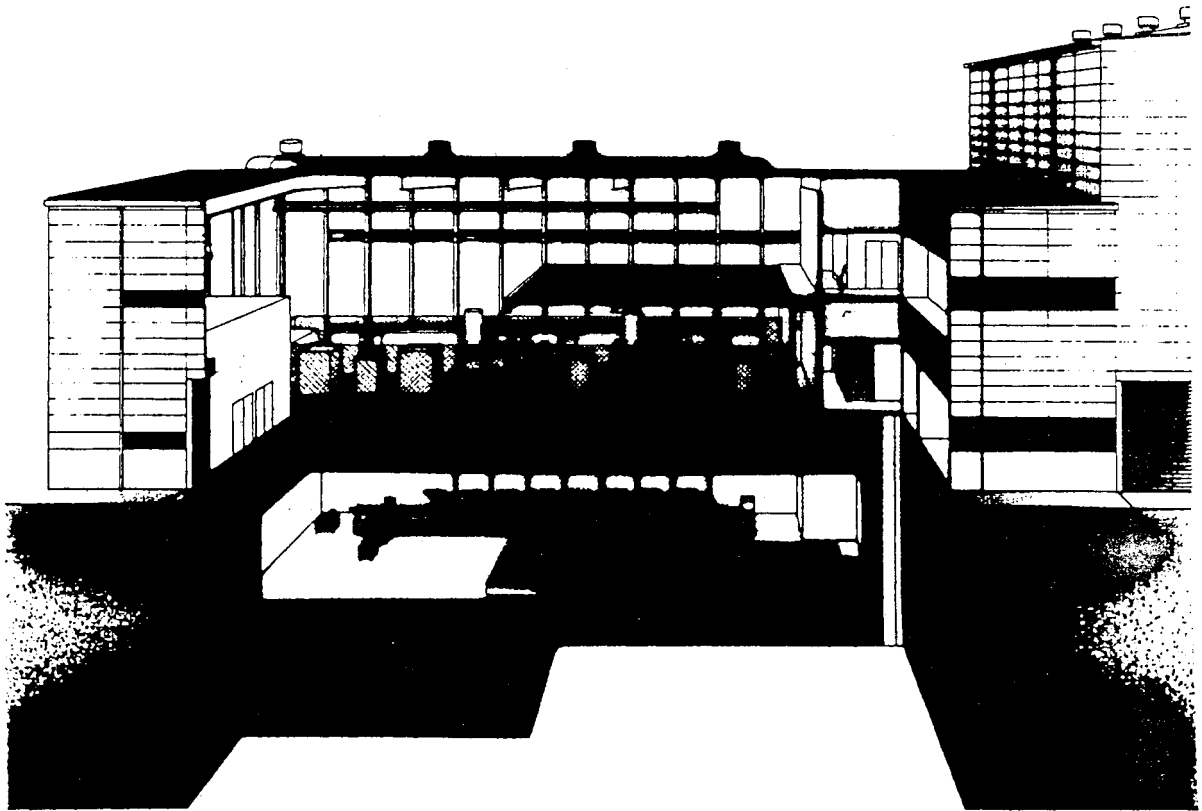
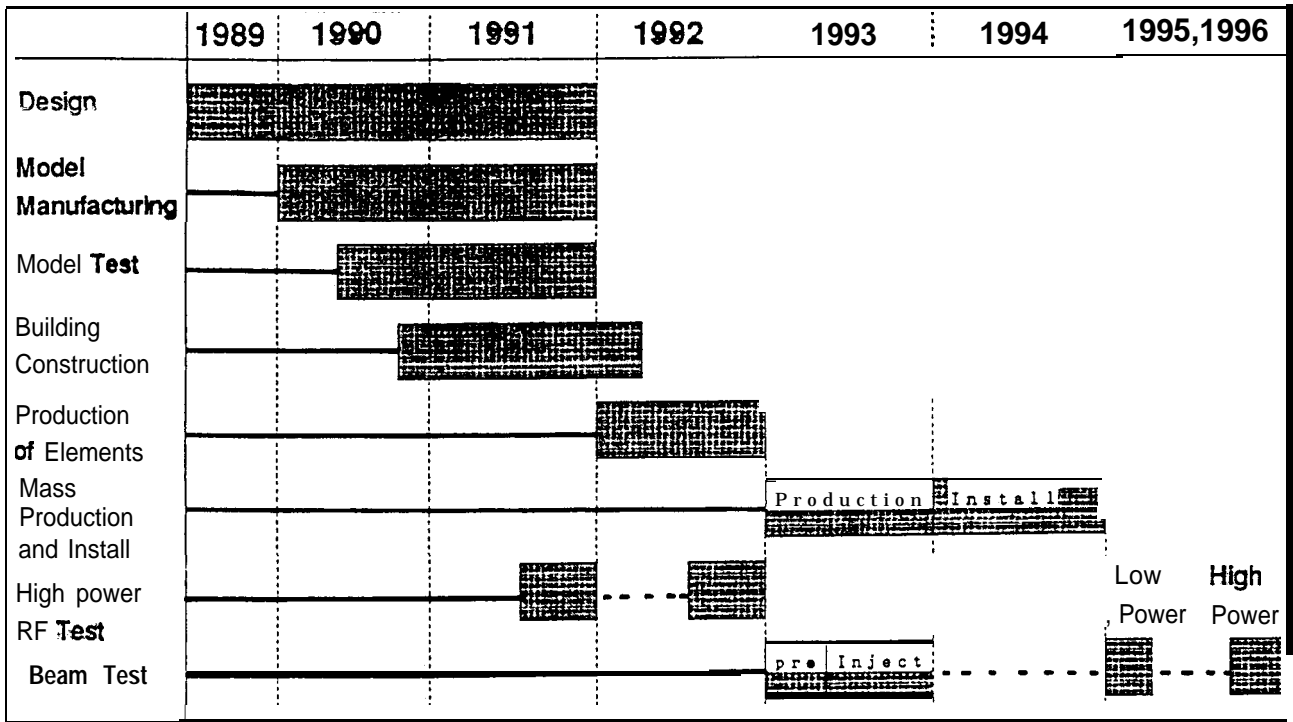
Example of Results

Buncher Test Cavity Raw Data



Buncher Test Cavity No- Ref. Frequency





设计部 机械部 电气部 仪表部 材料部 基建部 环保部 安全部 保卫部 后勤部 办公室

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