Magnets for the Electron Model

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FFAG WORKSHOP

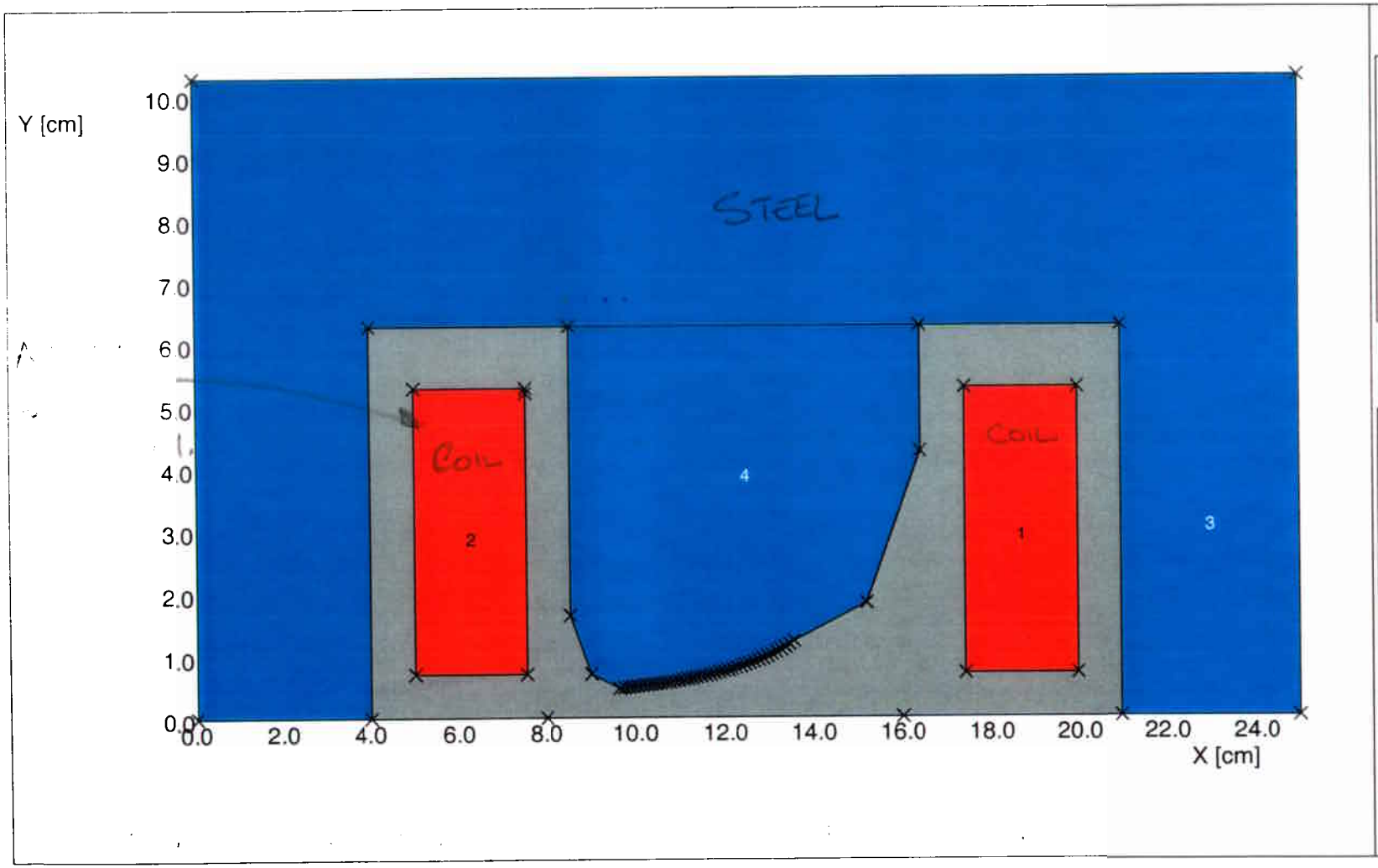
Electron Lattice and Magnet specifications

10-20 MeV/c electrons; cell tunes $\nu_x=\nu_y=0.35$, $B_{max} \leq 0.20$ Tesla,
$W \geq 1/4=.250$, 0.5 MV/cell @ 2.86 GHz

Lattice	# cells	Cell length (cm)	Circumference (metre)	Drift1 (cm)	Drift2 (cm)	W	Pc MeV/c
F0D0	27	40	10.8	15	15	.2586	17.908
Doublet	26	37	9.62	15	5	.2628	18.560
Triplet	23	46	10.58	15	5	.2676	19.095

Radiation soft, DC magnets, vacuum chamber not included

Lattice	Element	Length (cm)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle (rad)	B-peak Tesla	Aperture (cm)	HORIZONTAL VERTICAL APERTURE (cm)
F0D0	D	9.149 3.6"	0.1519	3.611 3611 g/cm	0.3932	0.1164	0.1929	1.95	0.975
F0D0	F	4.851	0	6.147	--	0	0.1929	4.41	
Doublet	D	11.71	0.1277	3.666	0.4847	0.1208	0.1928	2.46	
Doublet	F	6.29	0	6.194	--	0	0.1928	4.0	
Triplet	D	13.0	0.1337	3.343	0.4762	0.1366	0.1924	2.08	
Triplet	F	4.0	0	5.903	--	0	0.1924	3.69	



UNITS

Length	: cm
Flux density	: gauss
Field strength	: A m^{-1}
Potential	: Wb m^{-1}
Conductivity	: S m^{-1}
Source density	A cm^{-2}
Power	: W
Force	: N
Energy	: J
Mass	: kg

PROBLEM DATA
fodo_d4.st
Linear elements
XY symmetry
Vector potential
Magnetic fields
Static solution
Scale factor = 1.0
25241 elements
12807 nodes
5 regions

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OPERA-2d
Pre and Post-Processor

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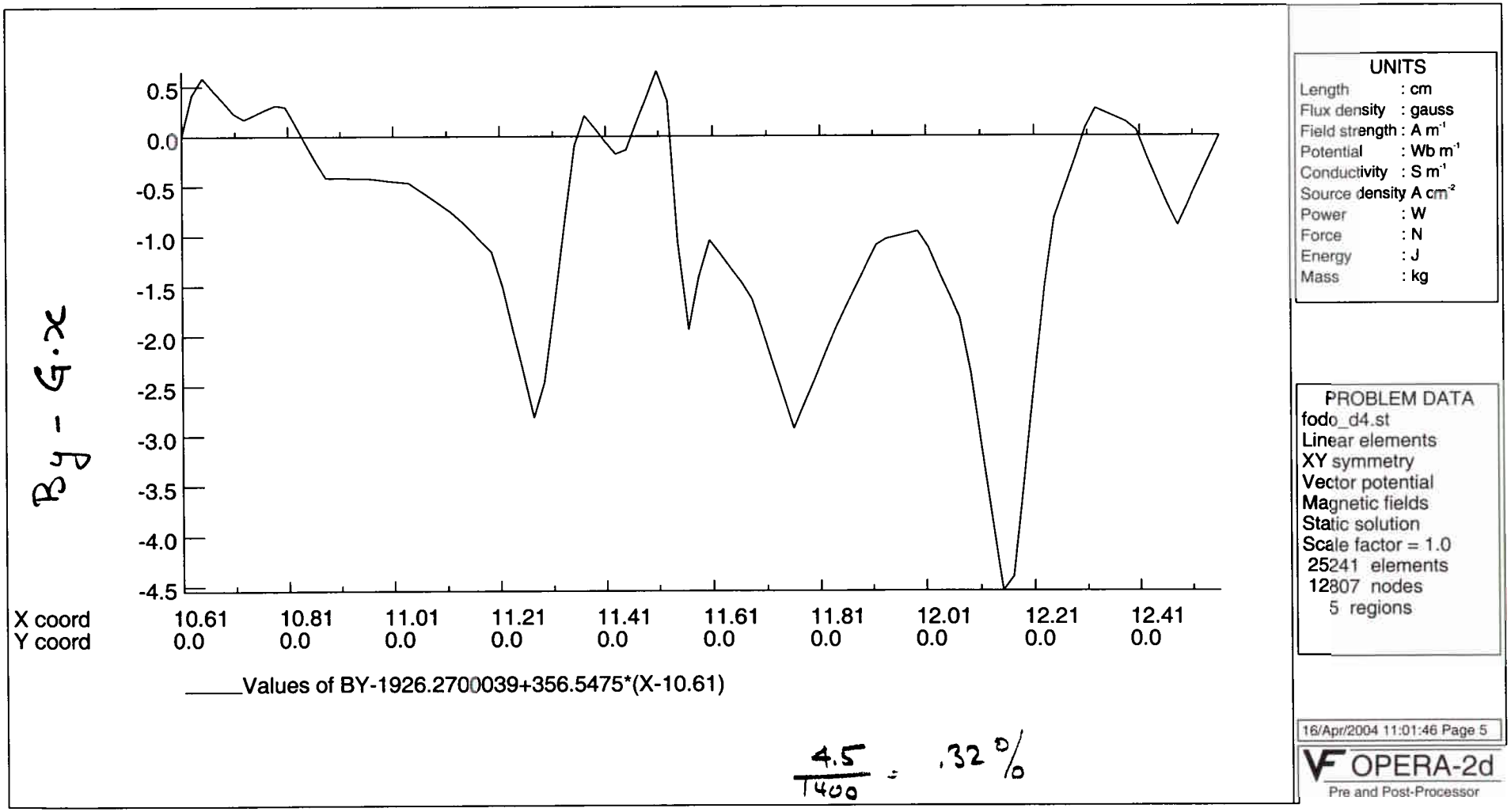
fodo_d4



$\frac{4.5}{1400} = .32\%$

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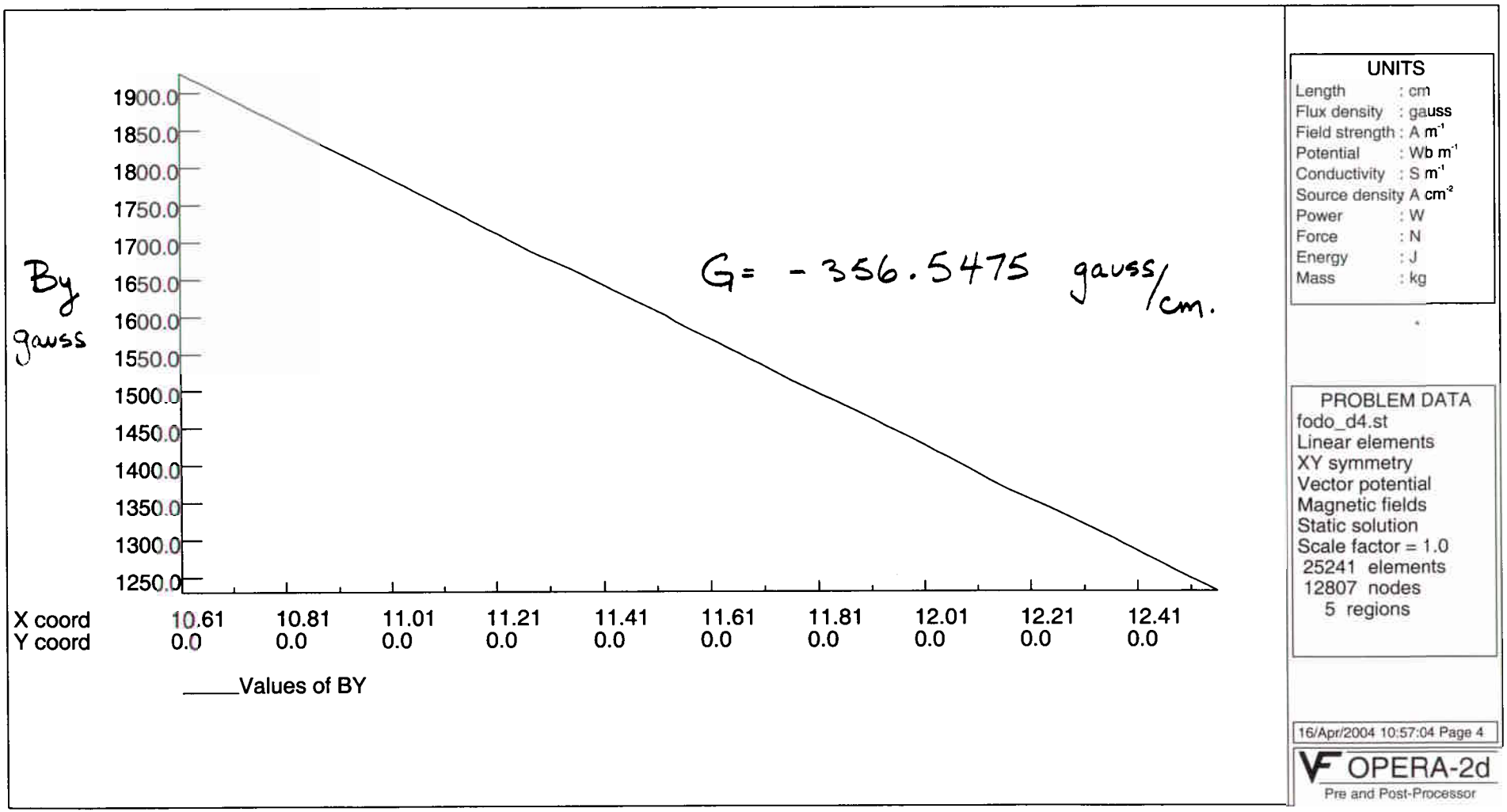
fodo_d4


By
gauss
1900.0
1850.0
1800.0
1750.0
1700.0
1650.0
1600.0
1550.0
1500.0
1450.0
1400.0
1350.0
1300.0
1250.0
G= -356.5475 gauss/cm.
X coord
Y coord
10.61 0.0
10.81 0.0
11.01 0.0
11.21 0.0
11.41 0.0
11.61 0.0
11.81 0.0
12.01 0.0
12.21 0.0
12.41 0.0
Values of BY
UNITS
Length : cm
Flux density : gauss
Field strength : A m-1
Potential : Wb m-1
Conductivity : S m-1
Source density A cm-2
Power : W
Force : N
Energy : J
Mass : kg
PROBLEM DATA
fodo_d4.st
Linear elements
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Scale factor = 1.0
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OPERA-2d
Pre and Post-Processor

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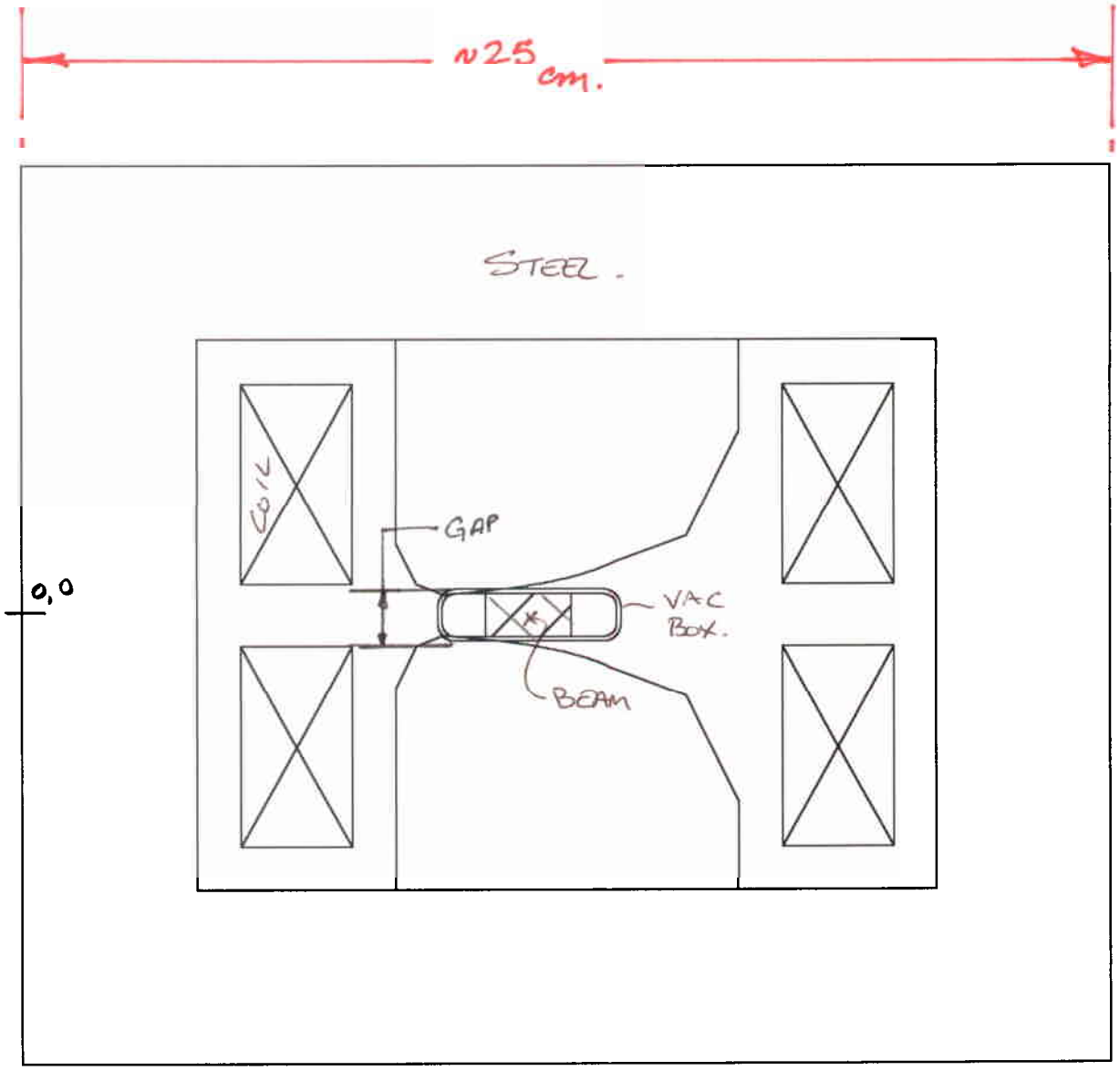

MACHINING TOLERANCE ON GAP $\sim \frac{\text{gap}}{10^3} = \frac{1.1}{10^3}$ cm $= .0011$ cm

$= 11$ MICRON

MAGNET COST SCALES WITH GAP^2.

$= \$$