DB dumps and lost RF space
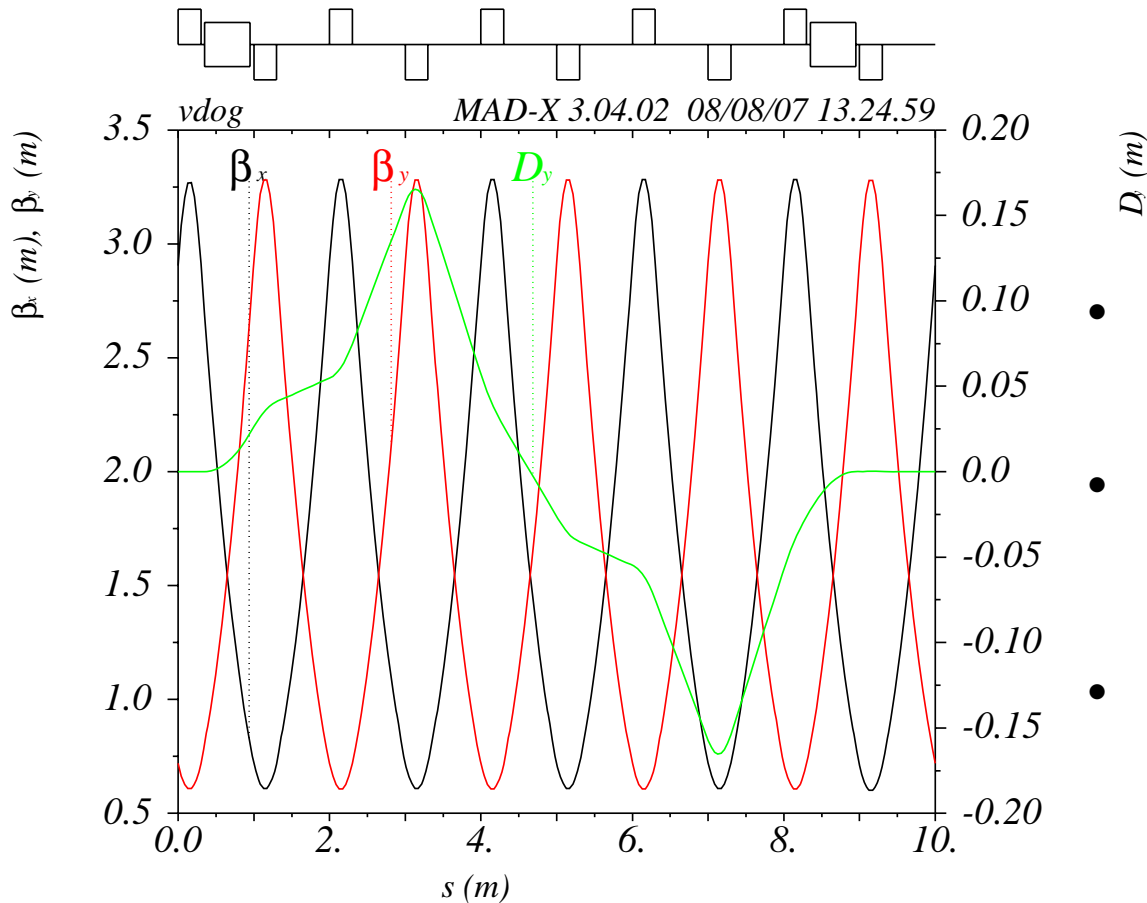
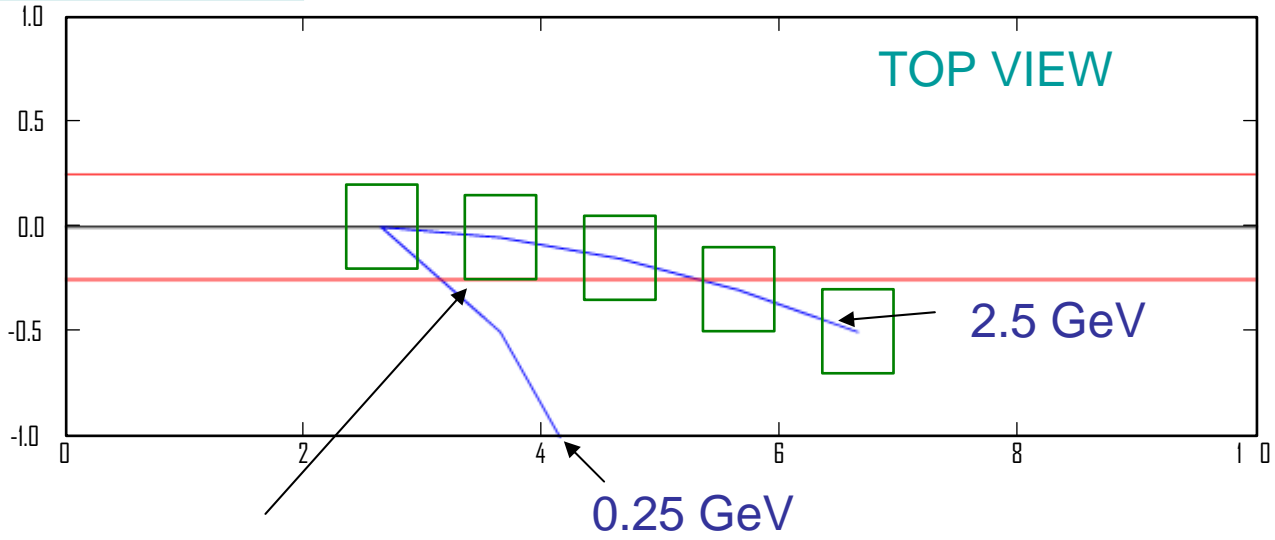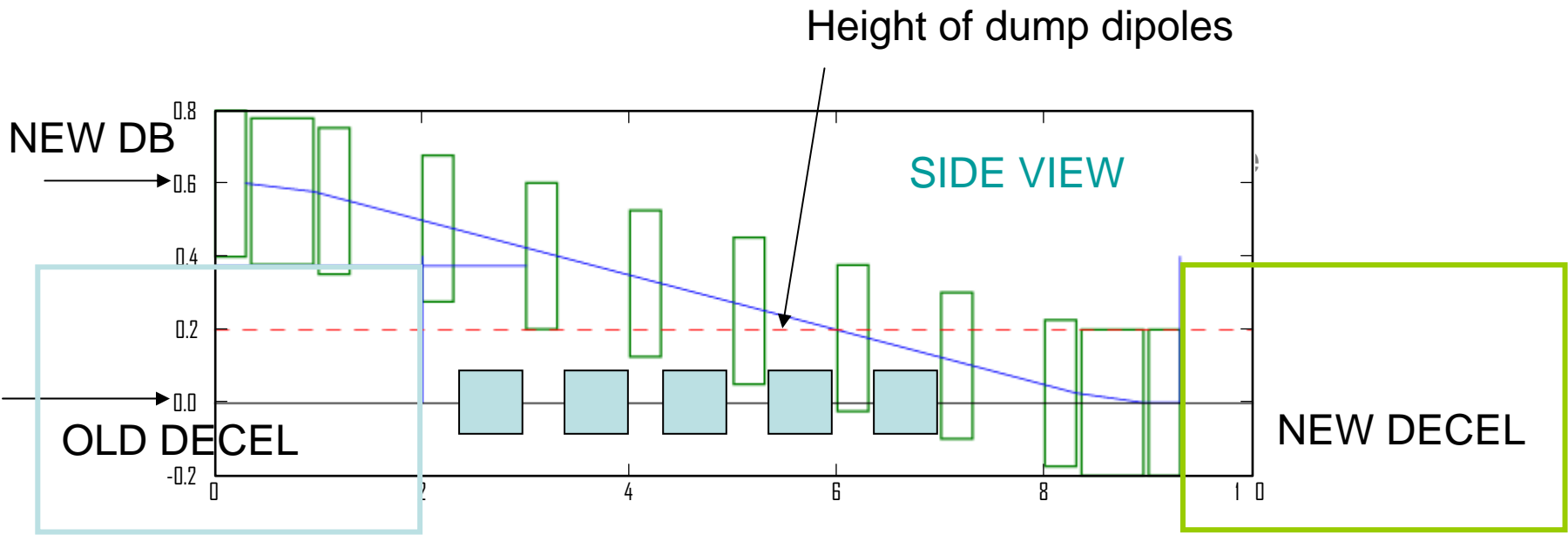B. Jeanneret

August 2007

DB interface between two stations

- Consider the option of the PETS all at the height of the Main Beam

- Need a dogleg at the end of the turnaround to escape the 'old BD' and its dump and go down to the PETS level for the 'new DB'

- AIM : minimise the lost longitudinal space

Optics

- Regular FODO identical to DB
  → same Quad/strength

- μ=2 π between dipoles to allow for D=D' =0 before and after

- Dipoles :
  - L = 0.6m
  - α = 0.075 mrad
  - B=1.04 T

CLIC TUNNEL TYPICAL CROSS SECTION

TRANSFER LINES

MACHINE SERVICES

TUNNEL SERVICES

36 kV cables

INSTALLATION CORRIDOR

SAFE PASSAGE

SAFETY AND ALARMS

DN250 + DN200 Raw Water Supply and return lines

0   1m   2m

CLIC.OE-1.1710.0004

DB dump BJ August 2007   4

Height of dump dipoles

NEW DB

SIDE VIEW

OLD DECEL

NEW DECEL

TOP VIEW

2.5 GeV

0.25 GeV

Width of DB quads

DB dump BJ August 2007

5

Dump dipoles (with T. Zickler)
-- preliminary --

H = 0.35m

V = 0.42m

b

c

g

c

b

b   c   a
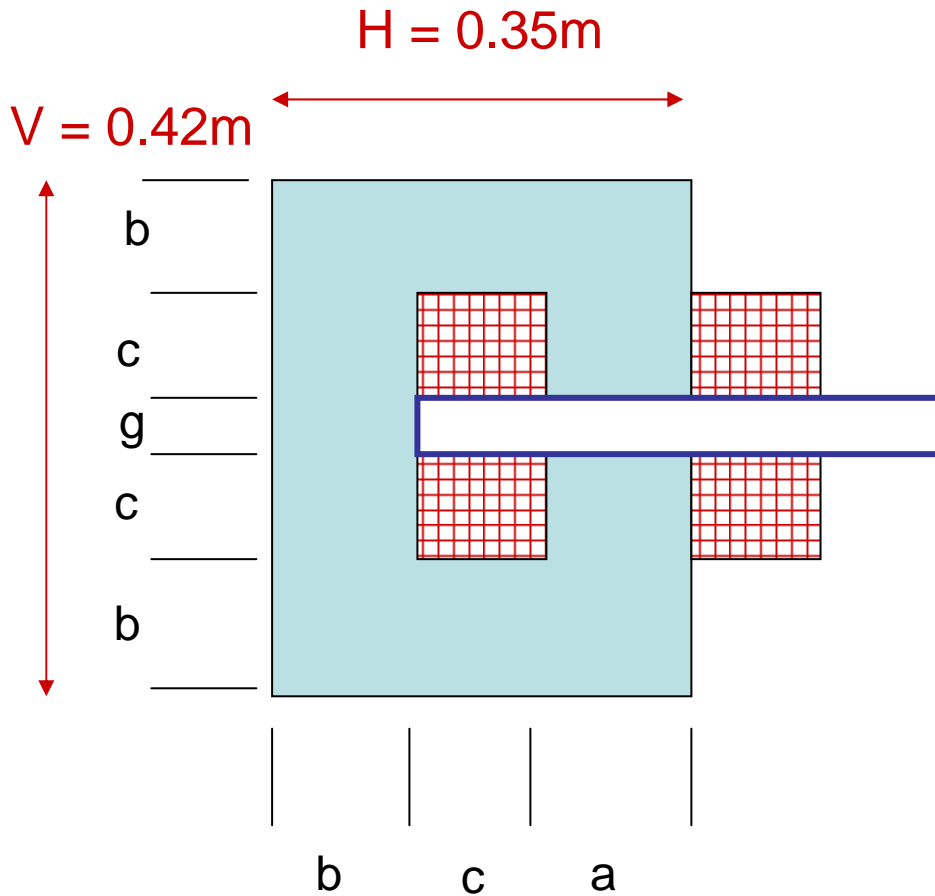
alfa		5.00E-02	rad	
len		6.00E-01	m	
p		2.50E+00	gev	
B		6.94E-01	T	
full gap	g	3.00E-02	m	
muz		1.26E-06		
I		1.66E+04		wire	1.60E-05
rho_i		1.20E+06	A/m2		(4x4 mm2)
fill factor		7.00E-01		I wire	1.92E+01
full coil_area		1.97E-02	m2	
coil_block		9.87E-03	m2	turns	8.63E+02
coil_side	c	9.93E-02	m	turn/bloc	4.32E+02
				matrix	20.77822
B_iron		1.10E+00	T	
				check	9.93E-02
full aperture	a	1.50E-01	m	(matrix*4mm/sqrt_fil
b_yoke	b	9.47E-02		
full yoke width		3.44E-01	m	
full yoke height		4.18E-01	m	

DUMP magnets

- For the case drawn above
  - L = 0.6m
  - α = 0.05 rad
  - B = 0.7 T
  - outer yoke size H/2 < 0.2m, V/2 = 0.2m
- Need to refine for the transverse beam profile
  - Not too large
  - Adequate transverse energy dilution

Summary for single height DB

- Space taken from RF/dump : 7.5 m
- This space may be useful for
  - MAIN BEAM intrumentation (Igor)
- Total non-RF space per linac :
  - $\rightarrow \Delta L = 26 \times 7.5 = 195$ m $\leftarrow$