

## Finalising TI2 optics and TCDI locations

**mainly:**

- **TI2 with 0/60/120° TCDI and minimal changes, as final layout**

**+ some remarks on**

- **possible alternatives - currently not followed up**
- **options to enhance the flexibility**

**adopted *final* solution with minimal changes to original layout:**

- **matched to SPS** (see InjWg 2 March '05)

- **matched to LHC V6.5**

**TCDMSIV stays close to MSI, downstream of Q16**

**TCDMSIH upstream of Q16 as presented last time**

**Q13 moved 1m upstream, more space for H060, V060, more symmetric**

**combination of **automatic** and **manual** matching without TCDI phase constraints**

**favour solutions further from current limits**

**strength from average pos/neg bump for flexibility,  $Dy < 1\text{cm}$   $Dy' < .001$**

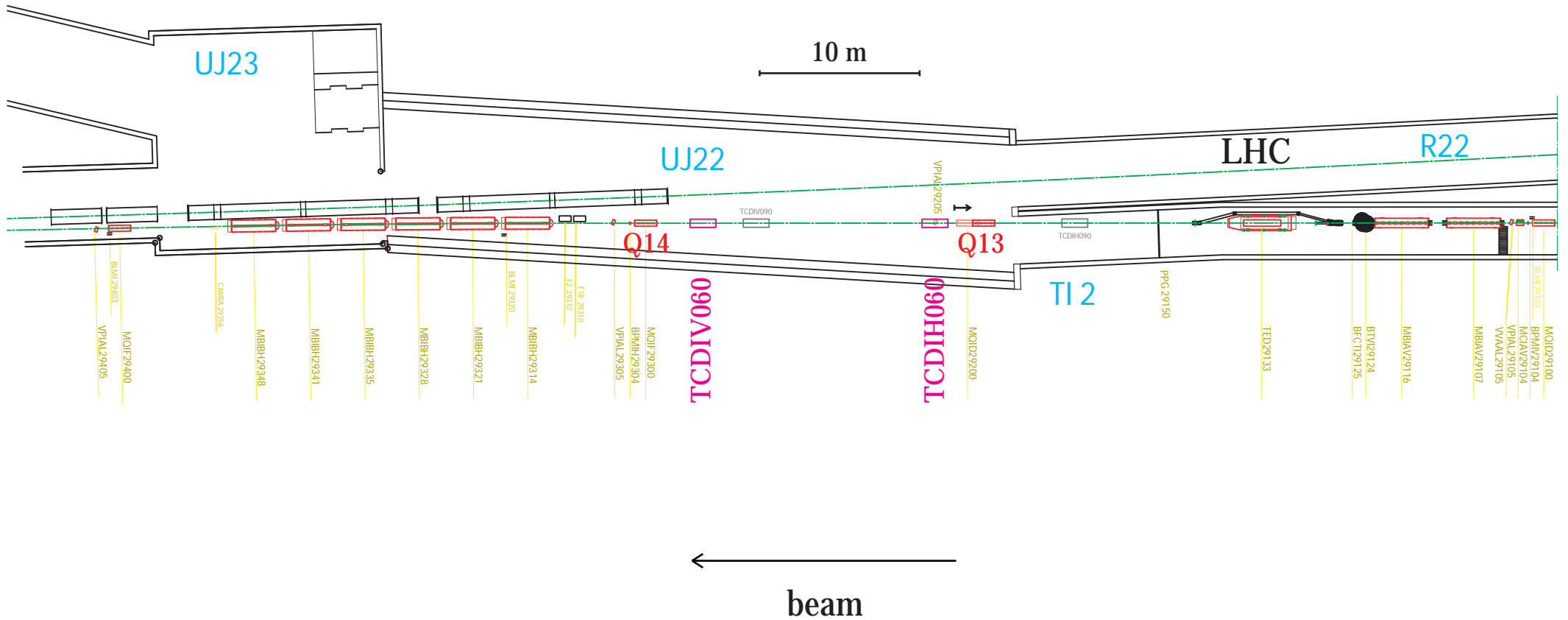
**place TCDIs at design phases**

**place the outside shields (of masks) next to downstream quads**

sequence and strength passed on to Thys, 14/6/05

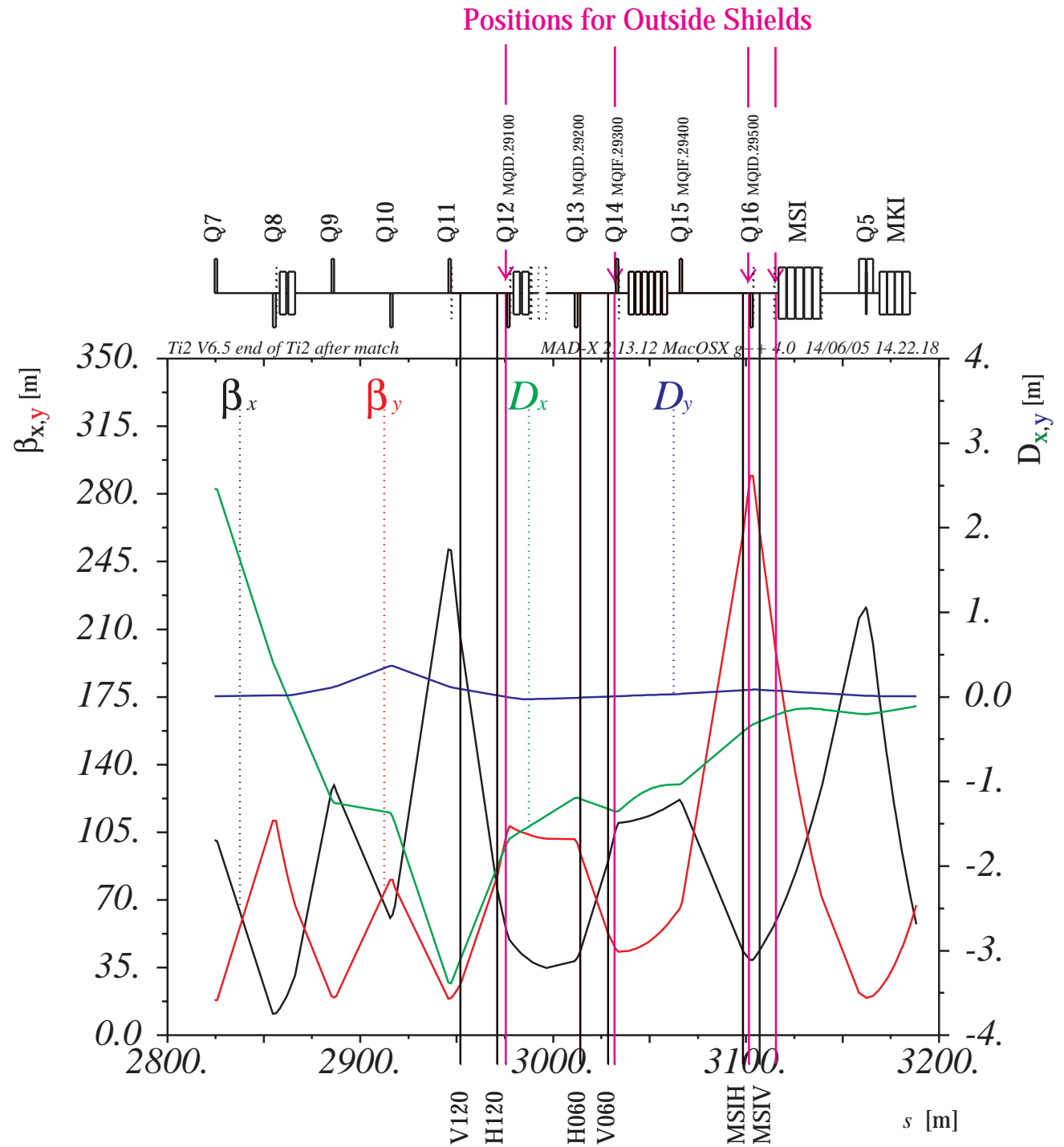
# TCDI V060 and TCDI H060 positions between Q13 (MQID29200) and Q14 (MQIF29300)

Q13 shifted upstream by 1 m

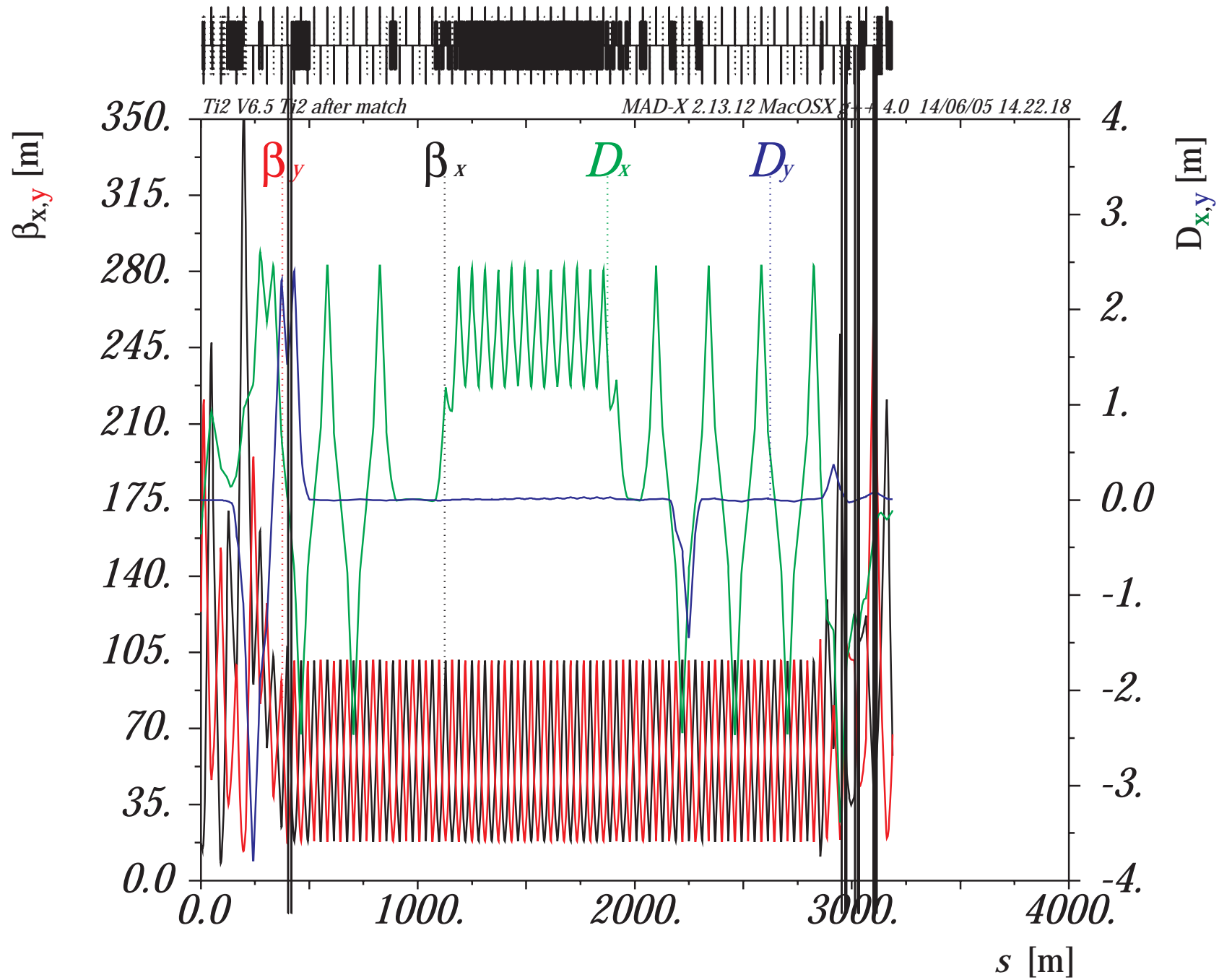


# End of *final* TI2 with TCDI 0, 60, 120° and TCDIshields

$\beta$	D
momV 19 m	1.5 m
V120 23 m	9.6 cm
H120 76 m	-2 m
H060 43 m	-1.2 m
V060 53 m	0.3 cm
HMSI 43 m	-0.41 m
VMSI 261 m	8.5 cm



# full TI 2 transfer line



## Conclusion

***final TI2 sequence with TCDIs and shields, fully matched available***

**---> database, survey, final checks**

## Remarks

**alternatives that have been looked at :**

**make Q17 MQIF.26800, Q18 MQID.26900 trimmable, improve Dy control**

**there is redundance with Q12, Q13 both QD and Q14, Q15 both QF**

- possible in series Q12=Q13, Q14=Q15**
- possible to go to alternate QD12, QF13, QD14, QF15, then QF13, QD14 very weak**
- possible to match with Q12 and Q14 turned off, Q7 at limit,  $\beta$ s up to 350 m**

**still planned :**

**study of flexibility, dispersion control with orbit correctors**

**currently up to 7° in phase to adjust with Quads to +/- sep bumps**

**comparison of price enhanced lattice control versus more TCDIs**