

TESLA QUADRUPOLE INSIDE THE SOLENOID OF THE DETECTOR

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SUPERPOSITION OF MAGNETIC FIELDS

1) « Short » CMS Magnet :

Coil + iron

$$B_0 = 4 \text{ T}$$

$$L_{\text{coll}} = 9 \text{ m}$$

$$\varnothing_{\text{bore}} = 6 \text{ m}$$

$$\varnothing_i = 6.36 \text{ m}$$

2) 2 quadrupolar doublets :

Simplified LHC Quad type

$$G = 250 \text{ T/m}$$

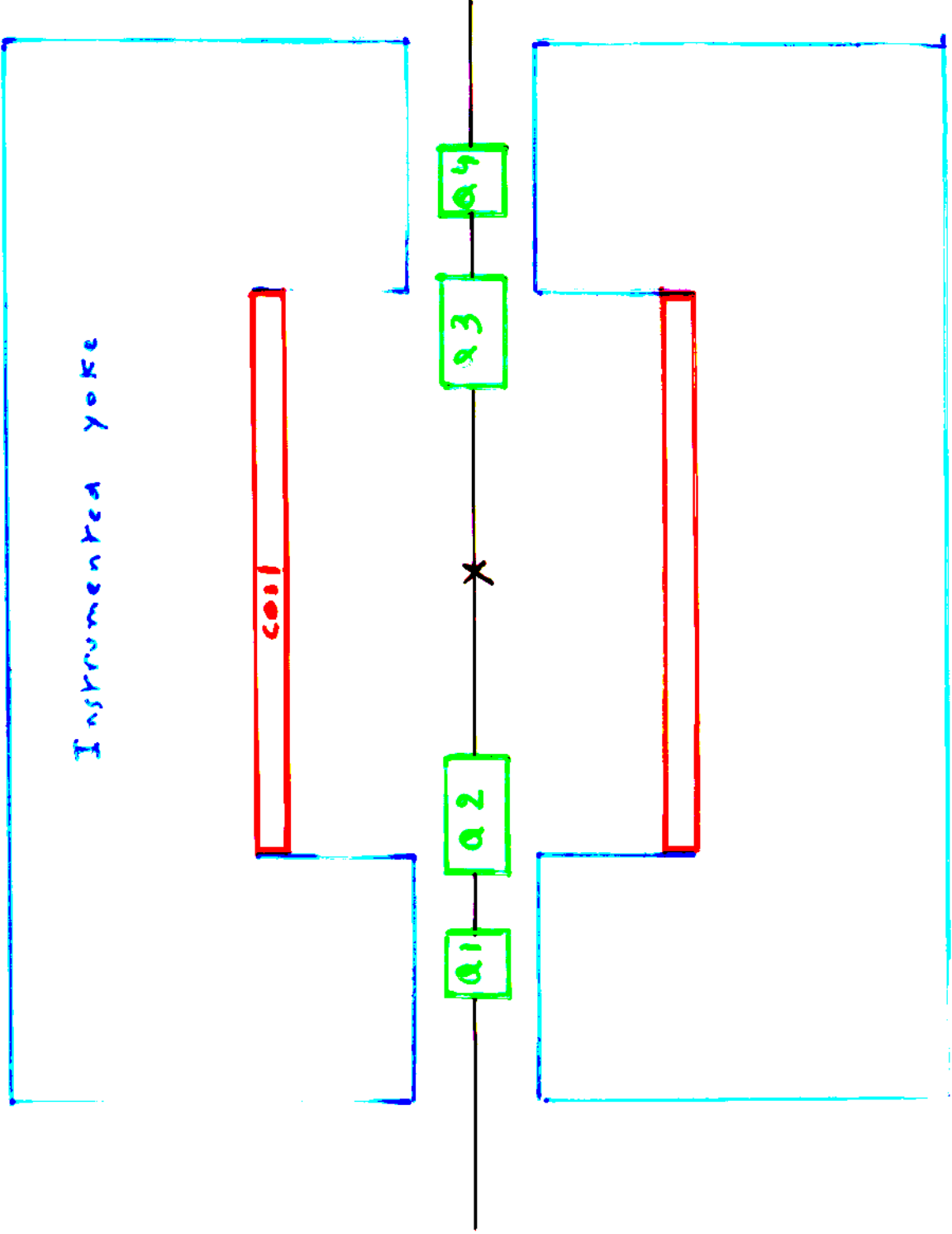
$$\varnothing_{\text{bore}} = 48 \text{ mm}$$

$$\varnothing_i = 56 \text{ mm}$$

$$Q_1, Q_4 : L = 1 \text{ m}, F_x \text{ for } e^-$$

$$Q_2, Q_3 : L = 1.7 \text{ m}, D_x \text{ for } e^-$$

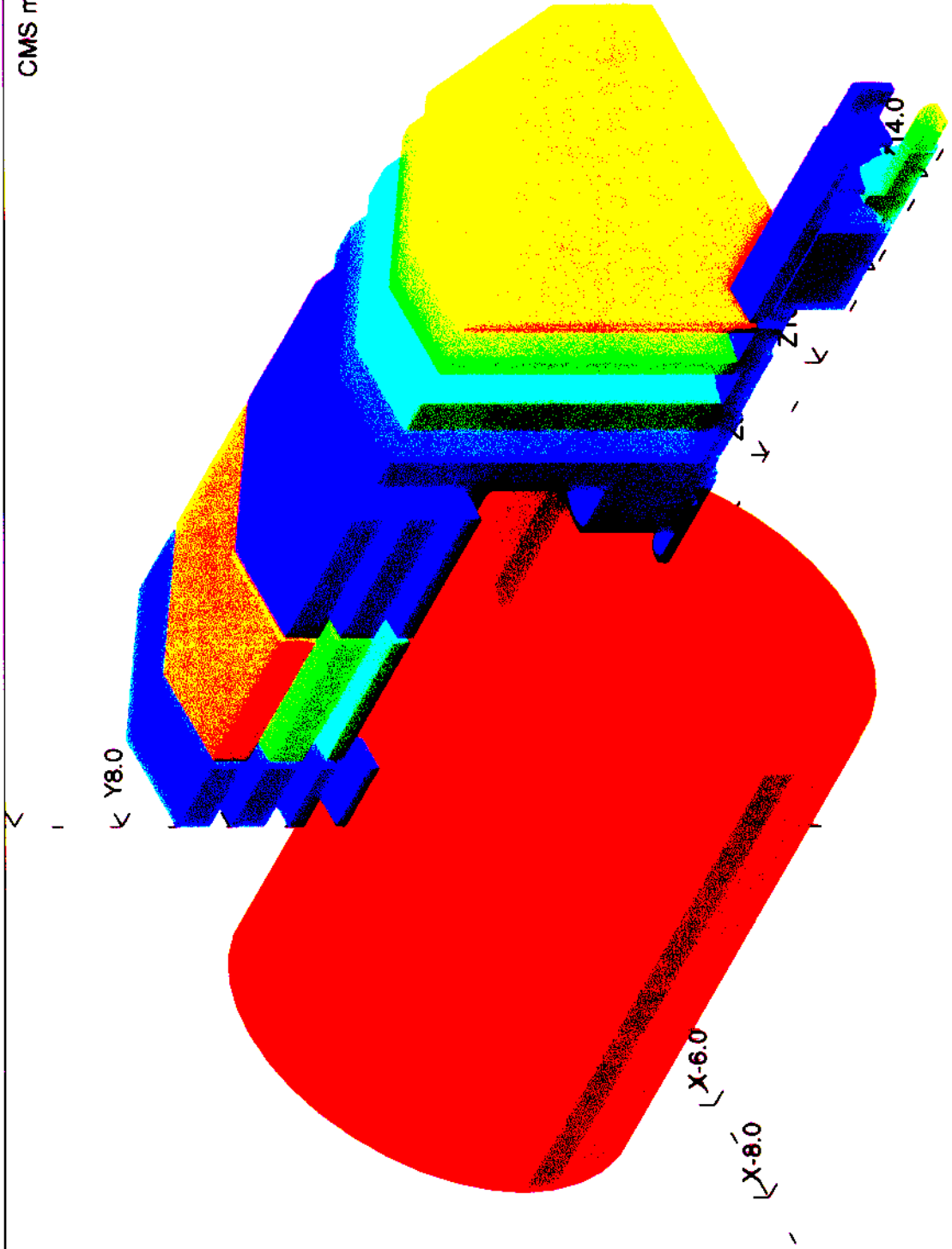
Calculations done by Slava Klioukhine (CEA/Saclay)



1m

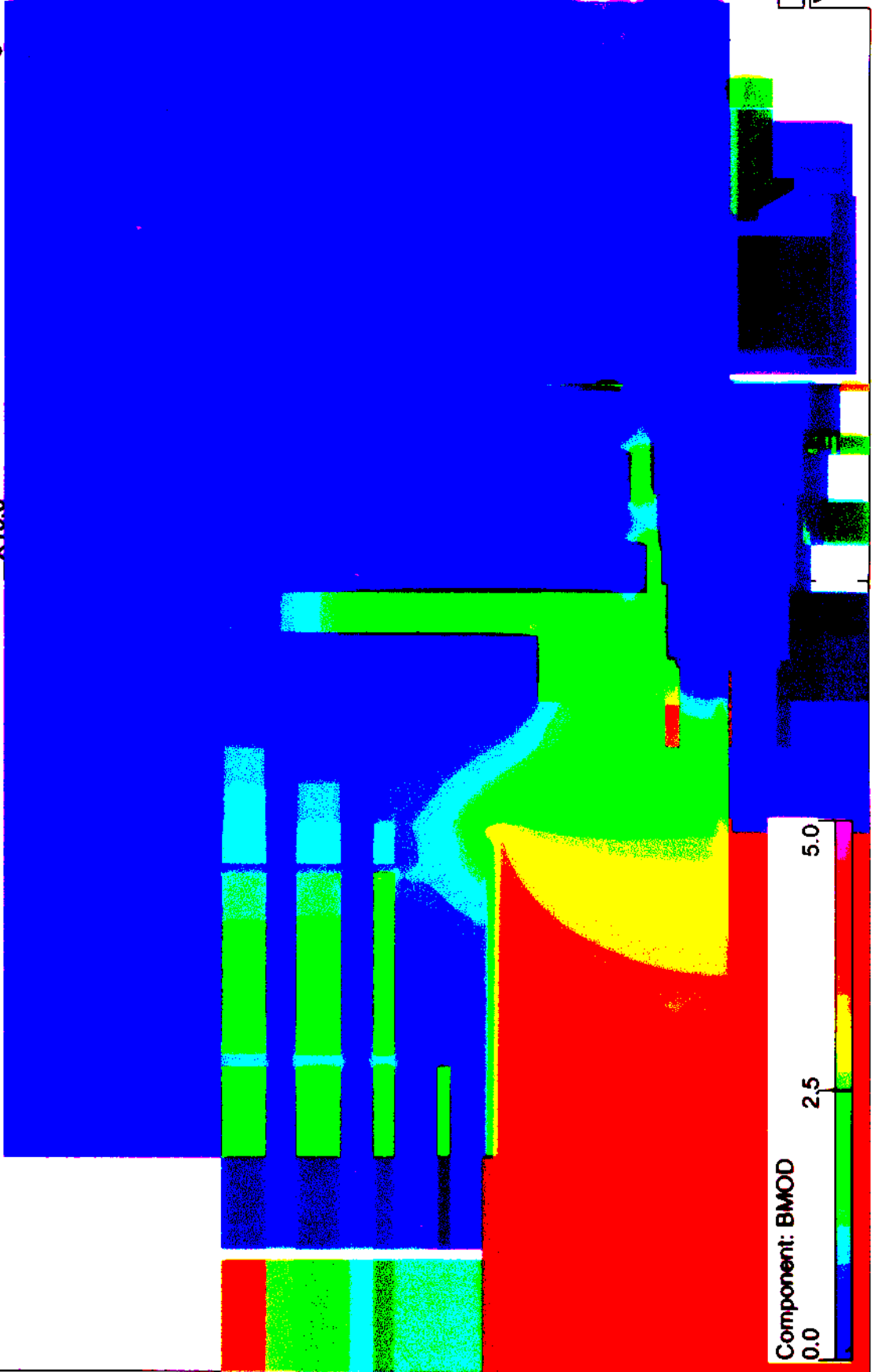
Fk 1512199

CMS magnet with quadrupoles



CMS magnet with quadrupoles

X10.0



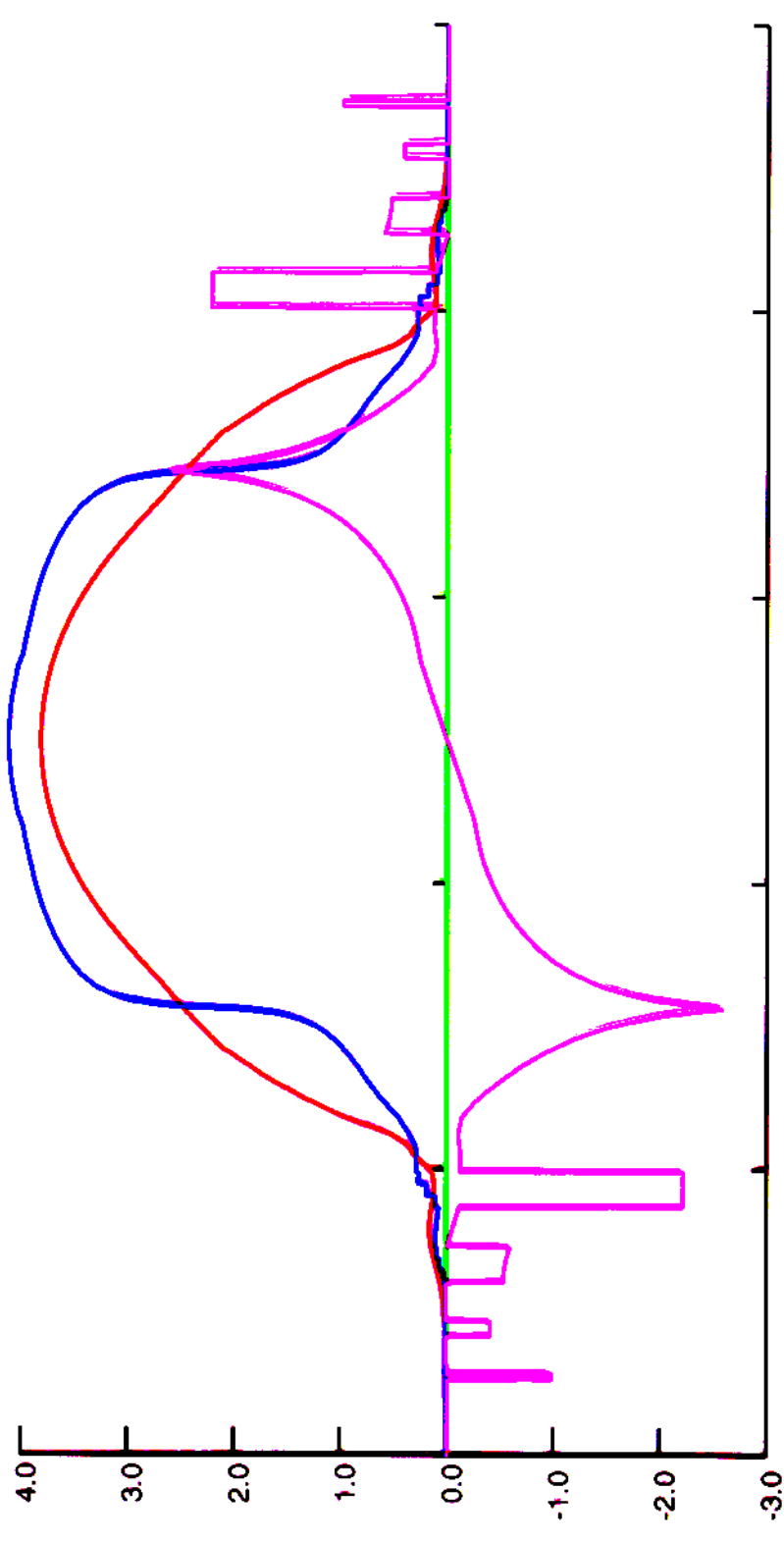
Component: BMOD

0.0

2.5

5.0

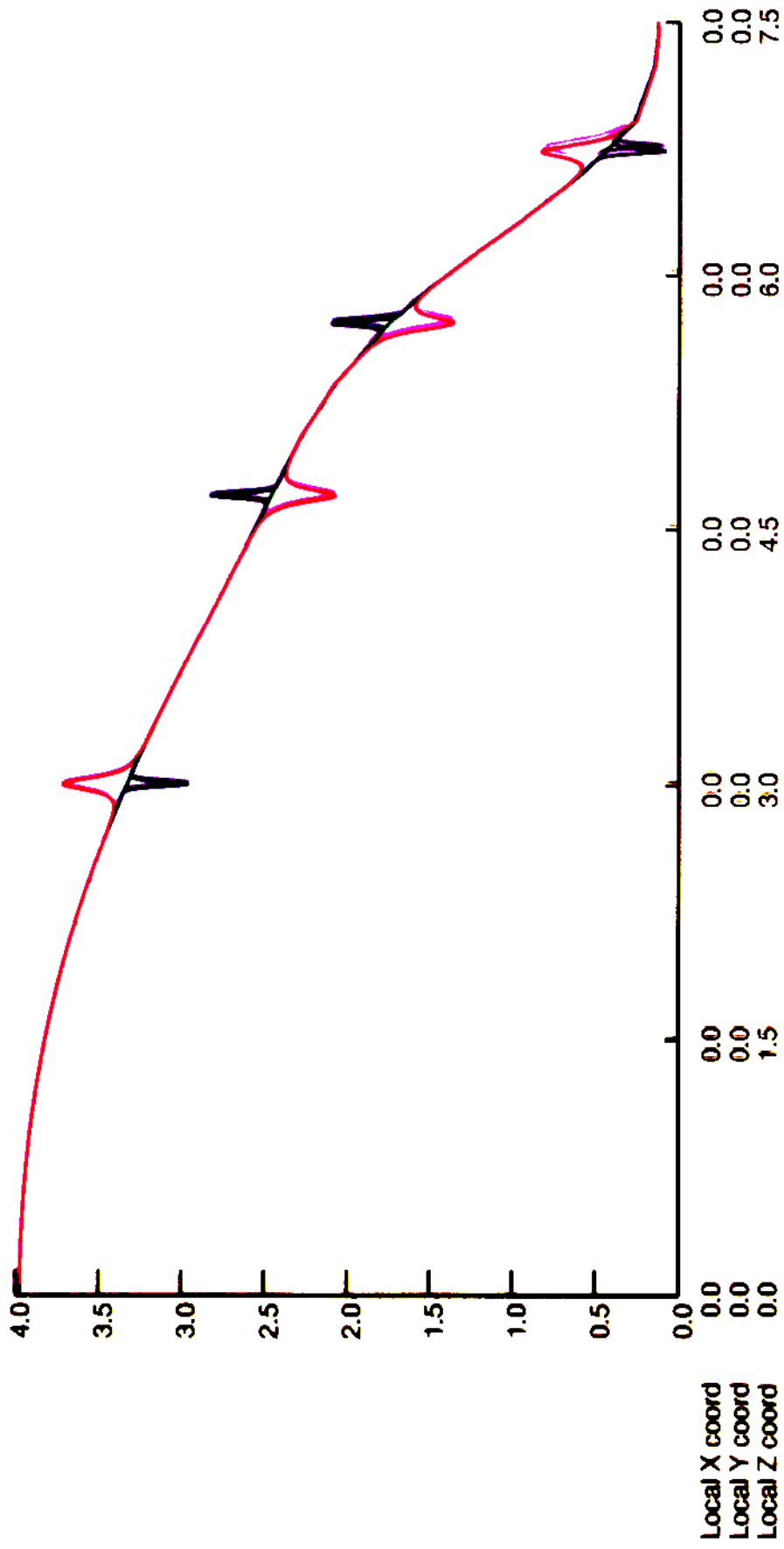
CMS magnet (3.82 T) with quadrupoles



Local X coord	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local Y coord	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local Z coord	-12.0	-7.2	-2.4	-2.4	7.2	12.0	

— Component: BZ, Integral = 38.3429 : Bz at r=0 m
— Component: SQRT(BX*BX+BY*BY), Integral = 2.20358E-08 : Br at r=0 m
— Component: BZ, Integral = 38.6418 : Bz at r=3.17 m
— Component: BX, Integral = -0.00281552 : Br at r=3.17 m

CMS magnet (3.97 T) with quadrupoles (0.31 MA-turns)

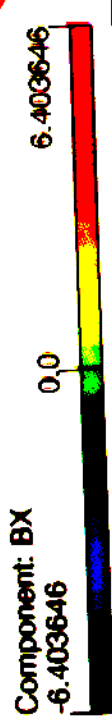
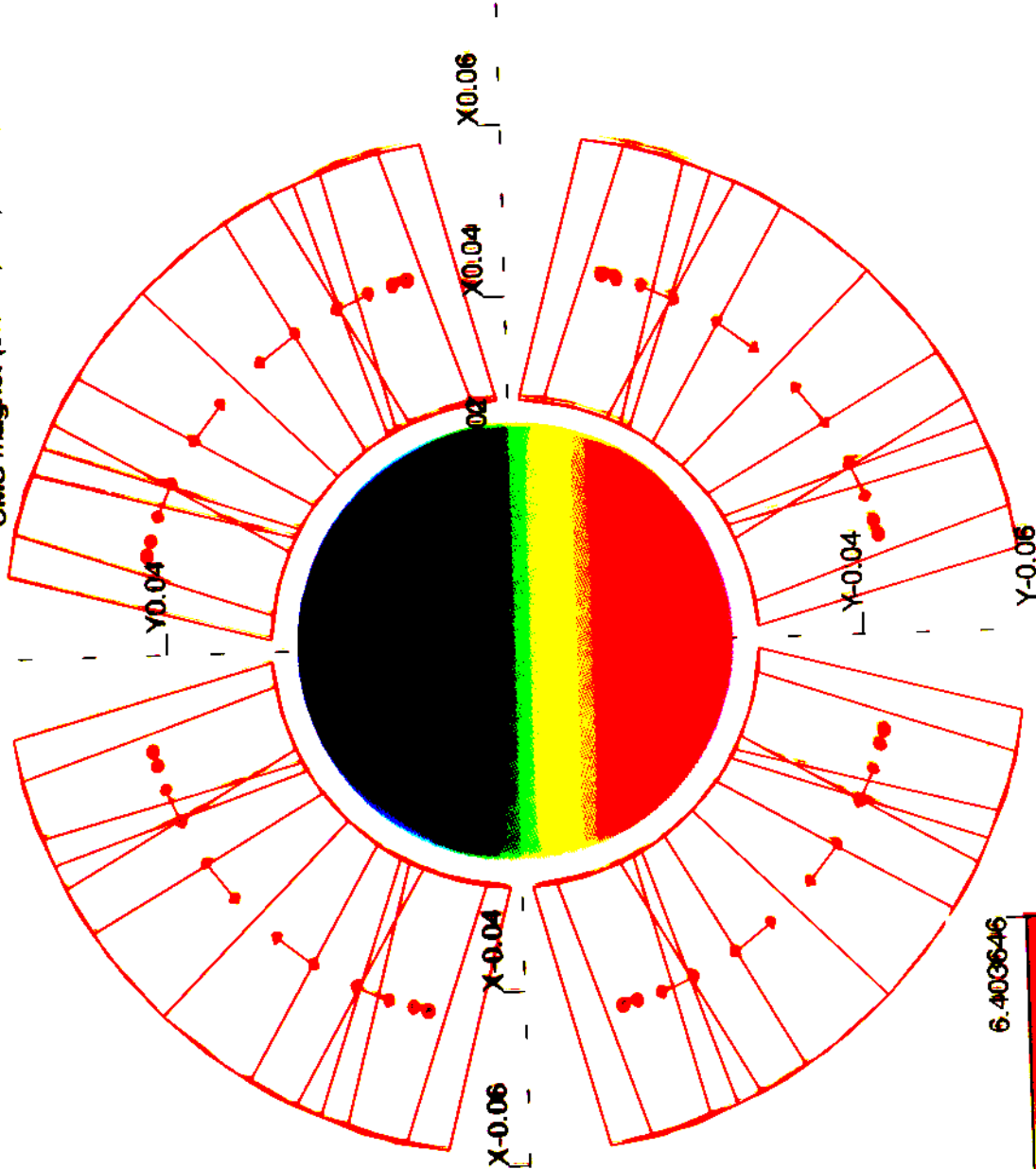


CMS magnet (3.97 T) with quadrupoles (0.31 MA-turns)



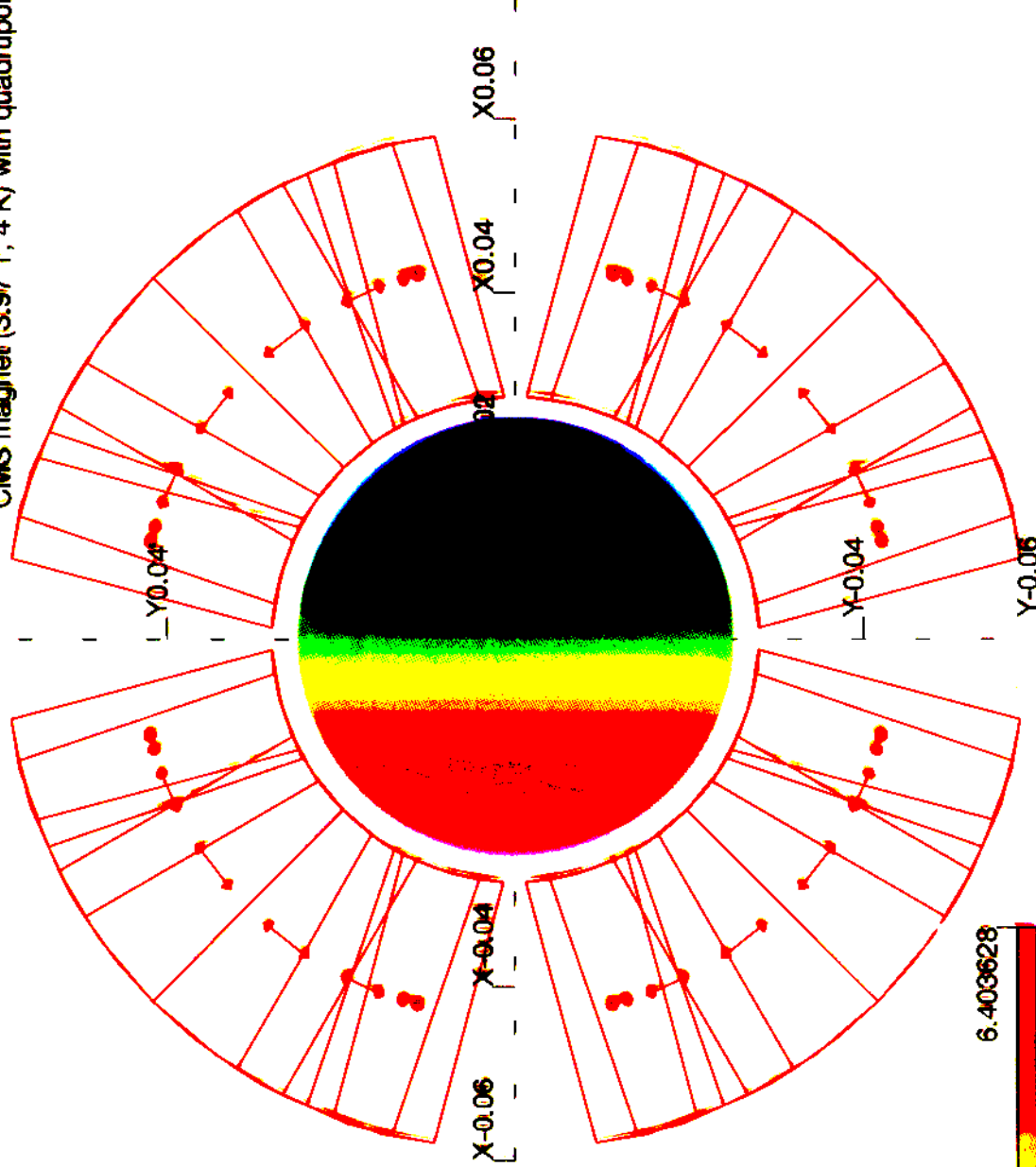
Q3, z=-3.853825 m

CMS magnet (3.97 T, 4 K) with quadrupoles (0.31 MA-turns)



Q3, z=-3.853525 m

CMS magnet (3.97 T, 4 K) with quadrupoles (0.31 MA-turns)

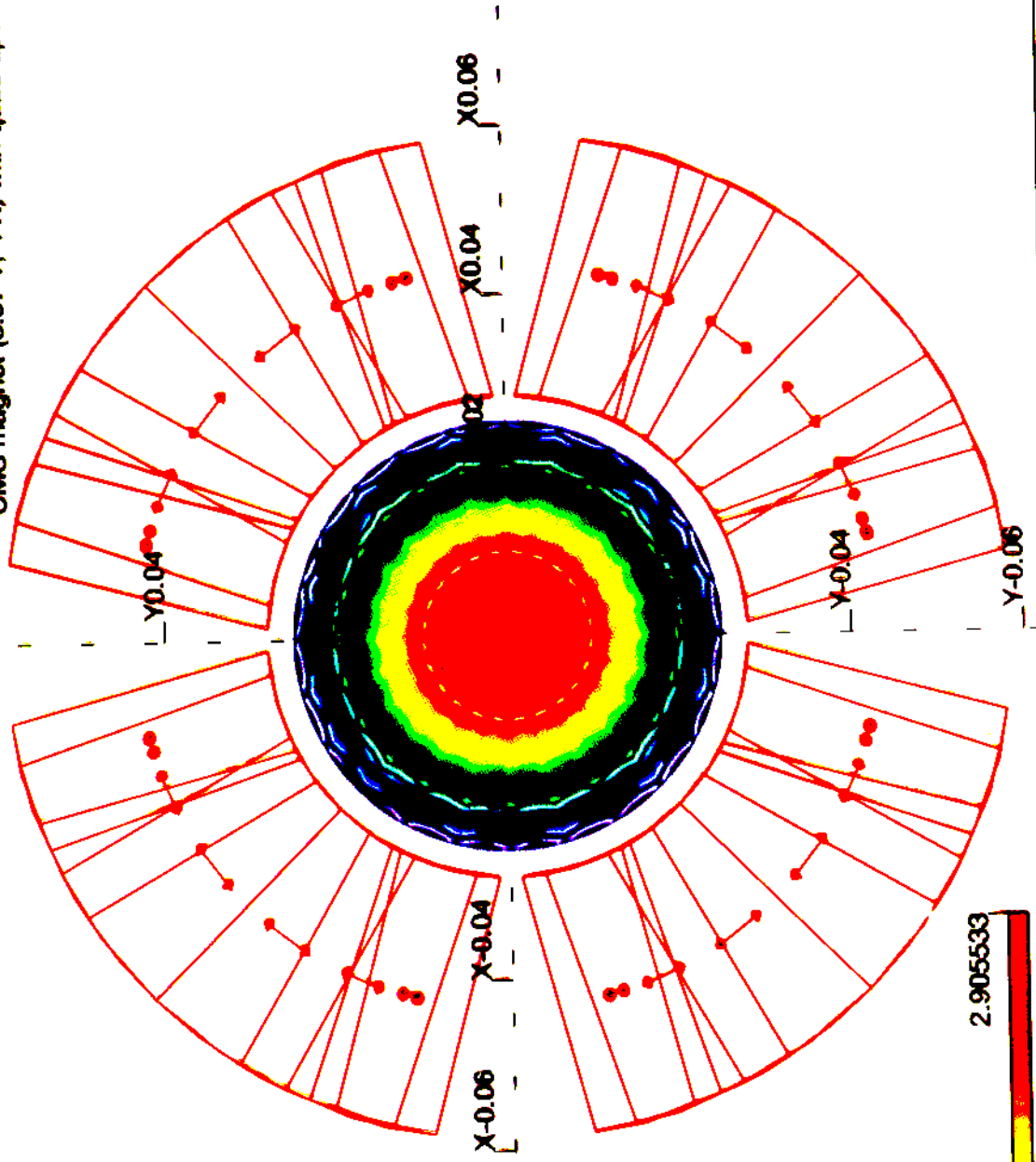


Component: BY
-6.403628



Q3, z=3.853825 m

CMS magnet (3.97 T, 4 K) with quadrupoles (0.31 MA-turns)



Component: BZ
2.905524

