

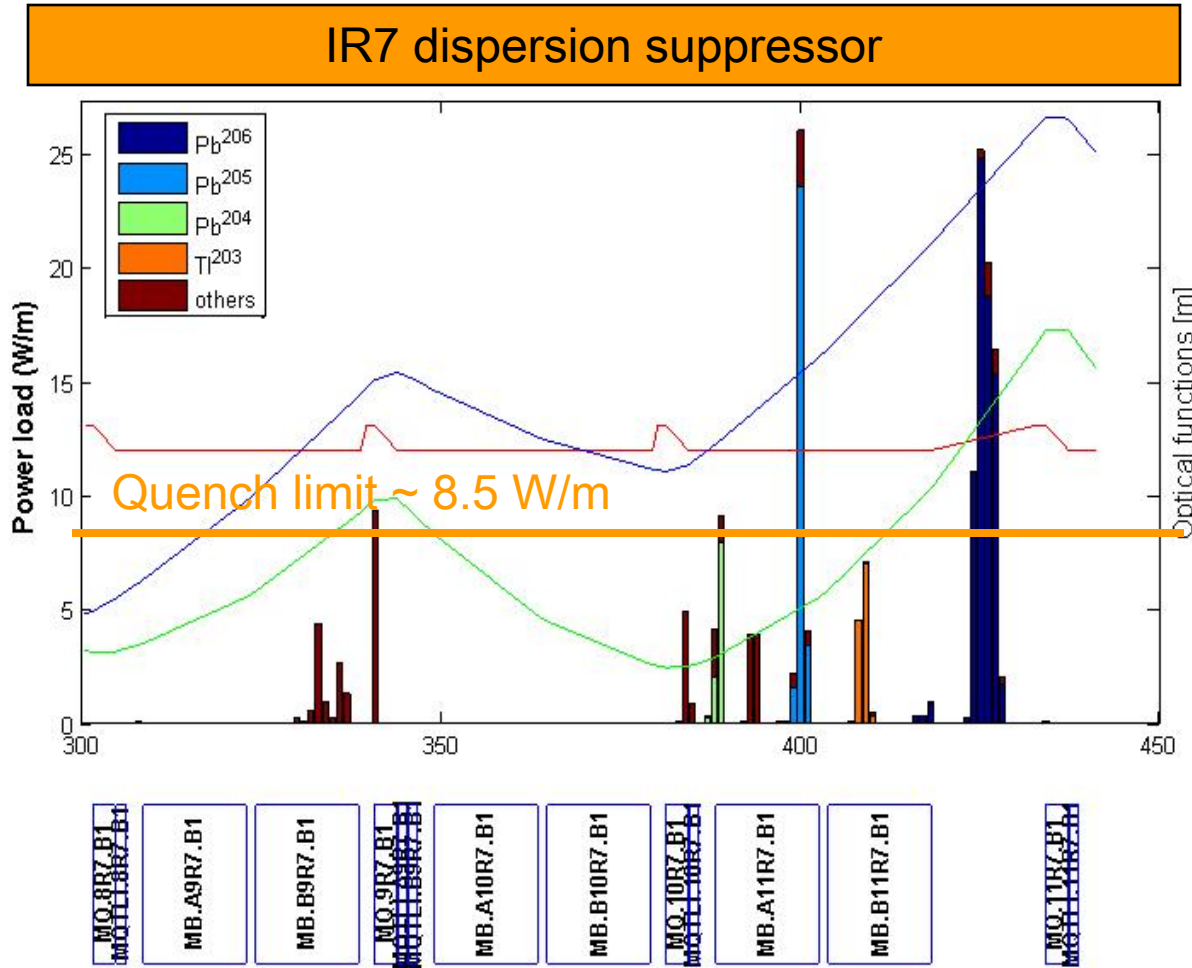
# Preliminary ion simulations for a Phase II system with cryogenic collimators



G Bellodi, AB-ABP-HSL  
for the ion collimation team

/// AB-ABP-LCU section meeting, 15/07/08

# Phase I system performance

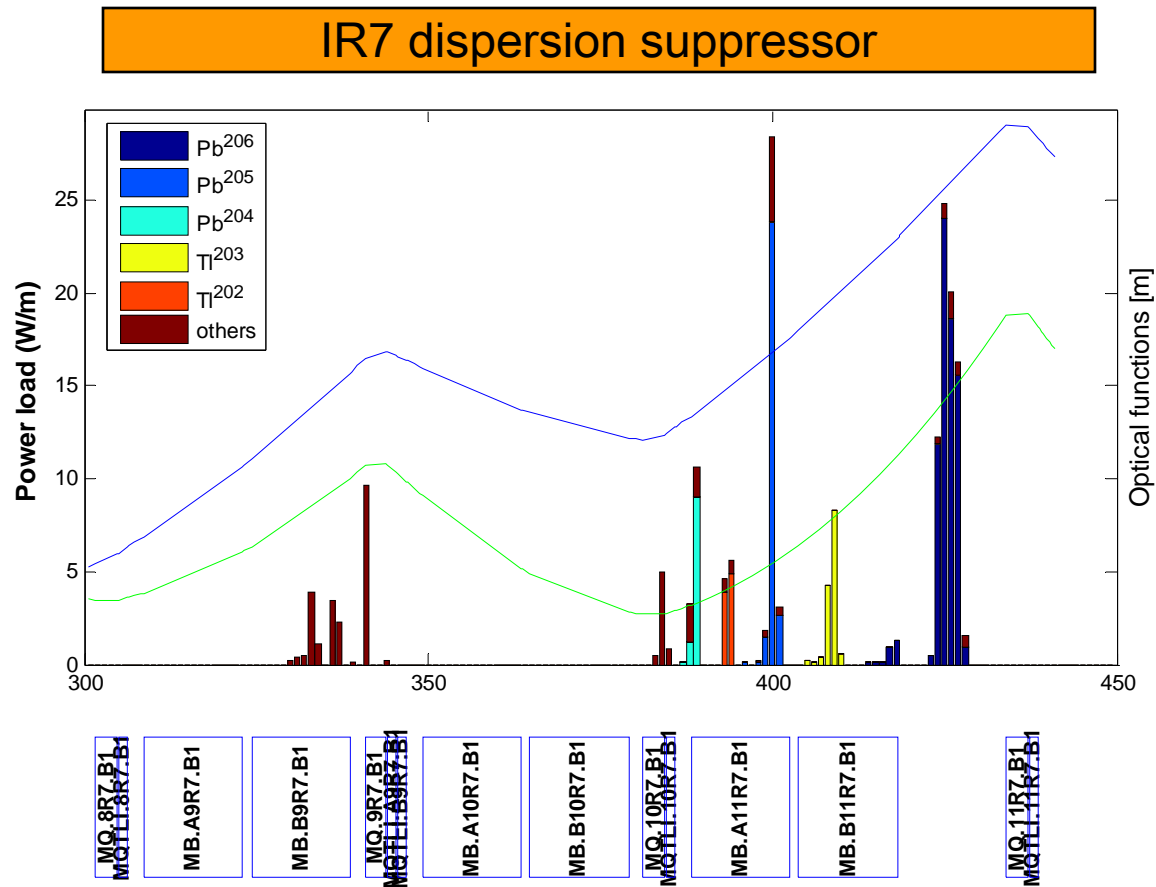


- Beam 1
- $E=2.76$  TeV/u
- FLUKA material xsections for C,W
- Standard collimator settings:  
 TCPs@ $6\sigma$   
 TCSs@ $7\sigma$   
 TCLAs@ $10\sigma$   
 TCTs@ $8.3\sigma$
- Ideal machine

$\eta=0.034$

→ ~ 30% I limitation..

# Standard Phase II collimators (TCSM metallic secondaries)

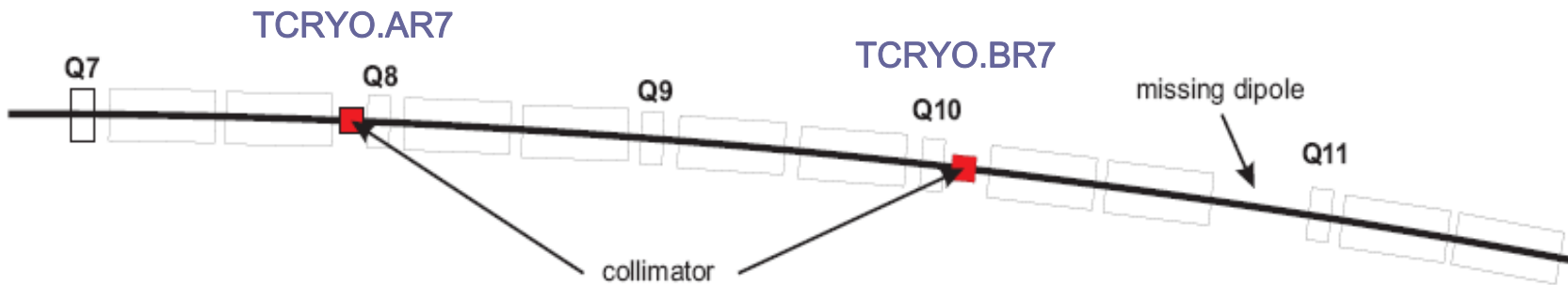


Phase I optics  
+  
Cu TCSMs  
activated at  $7\sigma$

$$\eta = 0.036$$

# Proposed addition of cold Cu primary collimators in DS7

- Th Weiler



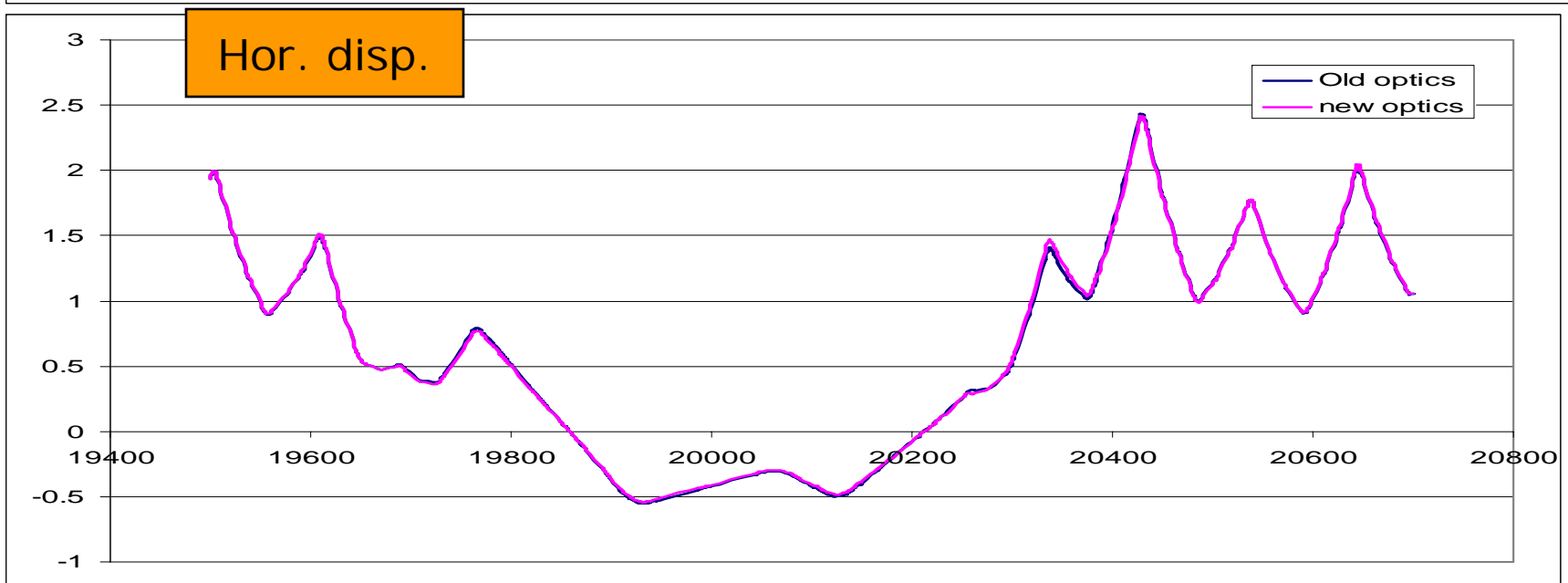
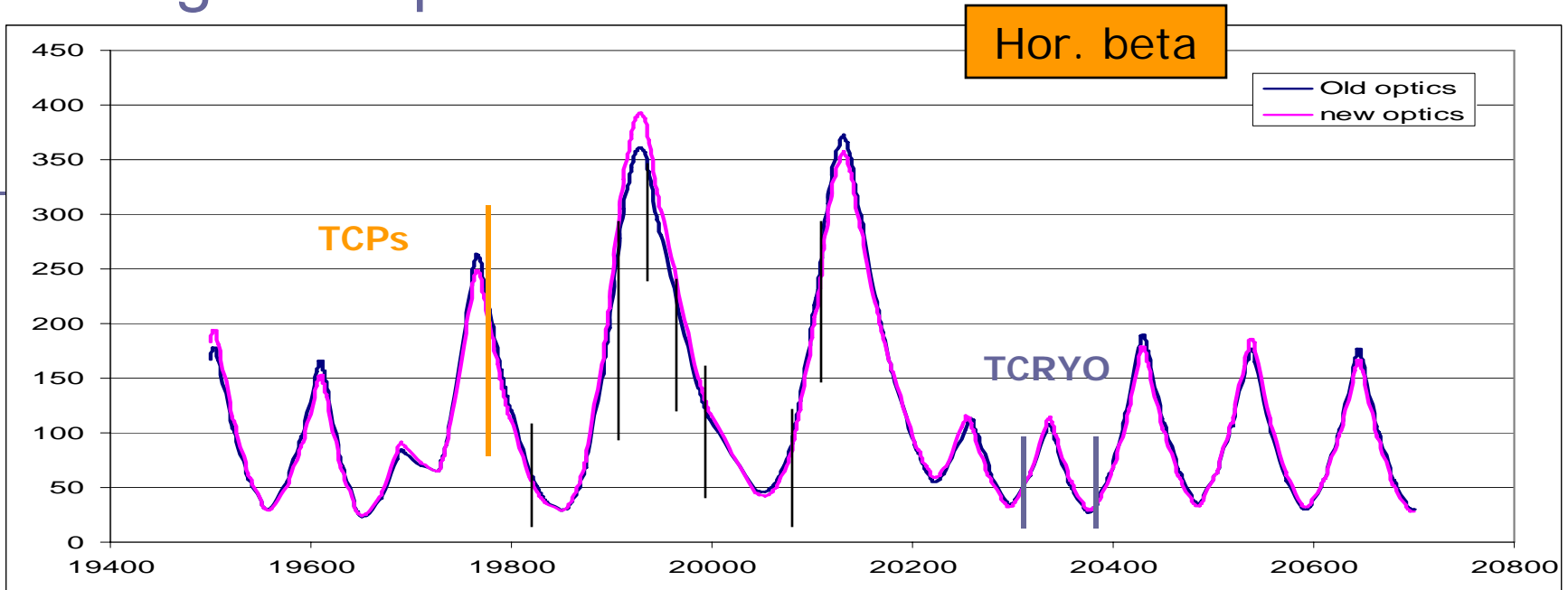
TCRYO.AR7 at 300.19m from IP7

TCRYO.BR7 at 387.29 from IP7

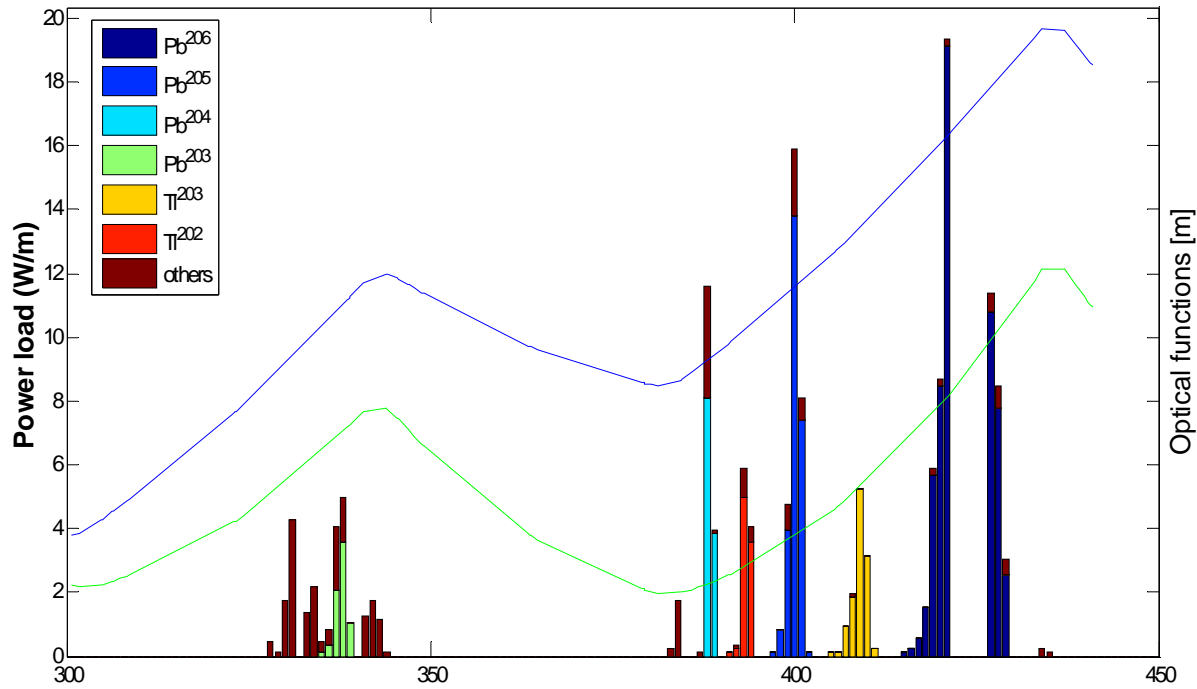
TCP	6.0
TCSG	26.5
TCSM	7.0
TCRYO	15.0
TCLA	10.0

IR7 collimator settings in  $\# \sigma$

# Changes in optics V6.500



# Effect of optics change



Phase I  
collimation  
scheme

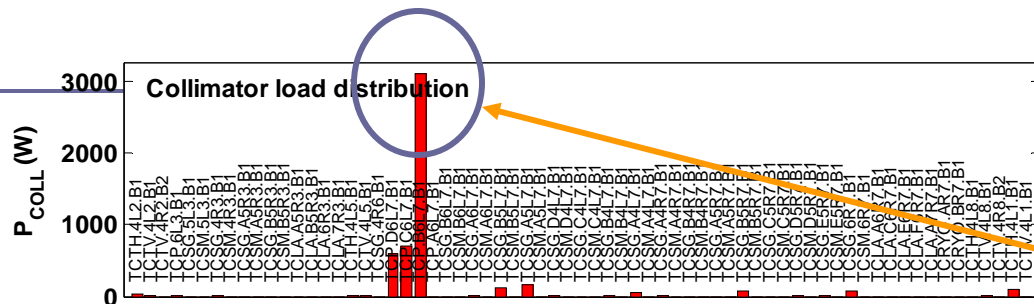
+

new optics

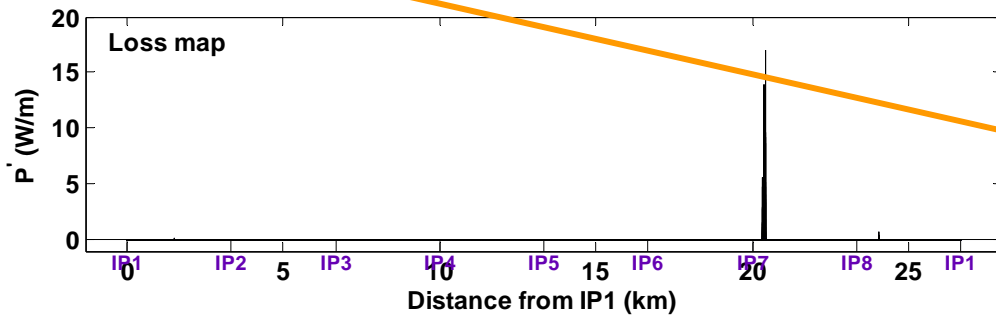
$$\eta = 0.031$$

~~TCRYO-AR7.B1~~  
~~MQ.8R7.B1~~  
~~MCFLI.8R7.B1~~  
 MB.A9R7.B1  
 MB.B9R7.B1  
~~MQ.9R7.B1~~  
~~MCFLI.9R7.B1~~  
~~TCRYO.9R7.B1~~  
 MB.A10R7.B1  
 MB.B10R7.B1  
~~MQ.10R7.B1~~  
~~MCFLI.10R7.B1~~  
~~TCRYO.10R7.B1~~  
 MB.A11R7.B1  
 MB.B11R7.B1  
~~MQ.11R7.B1~~  
~~MCFLI.11R7.B1~~

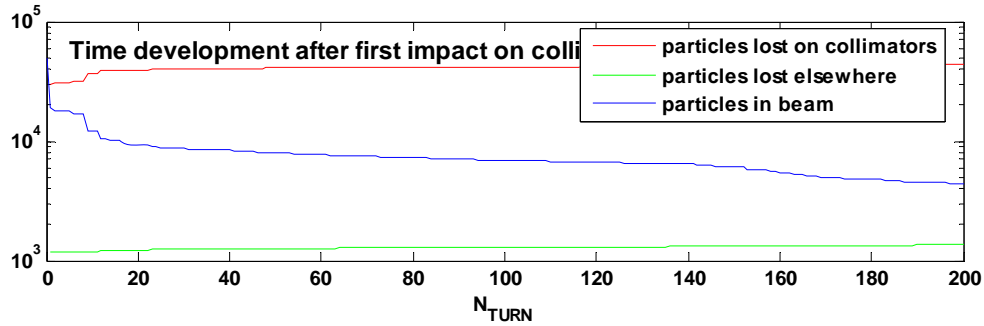
# Effect of optics change II



~+30% higher load on TCP.B6L7



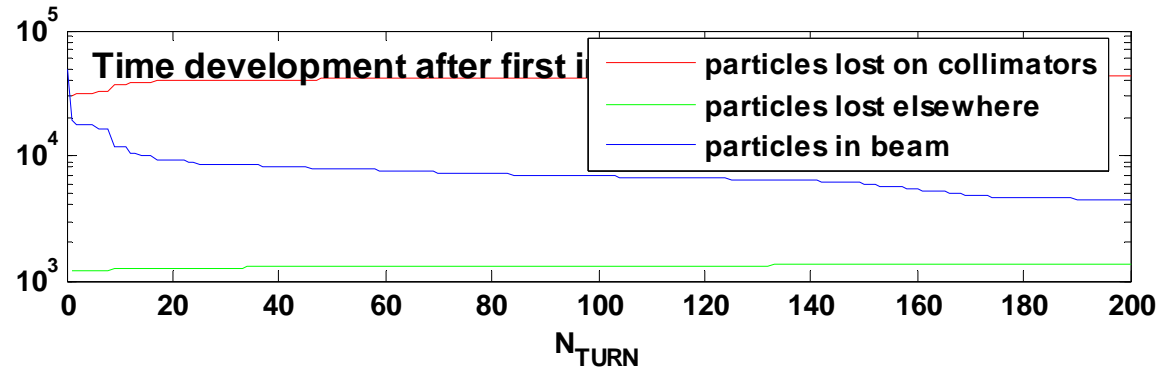
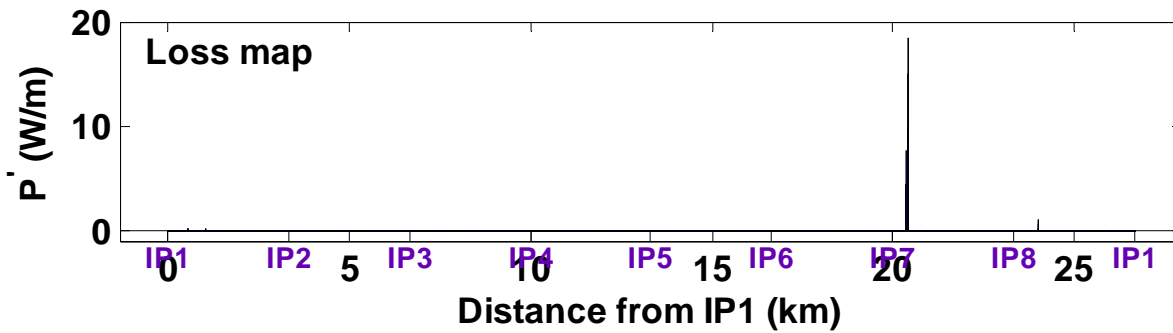
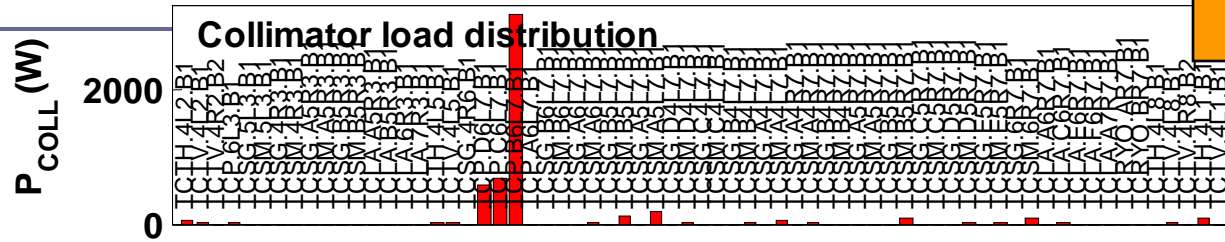
Less load on tertiaries (almost zero for TCTV.4L2)



Different impact parameter distribution on collimators?  
..to be further studied..

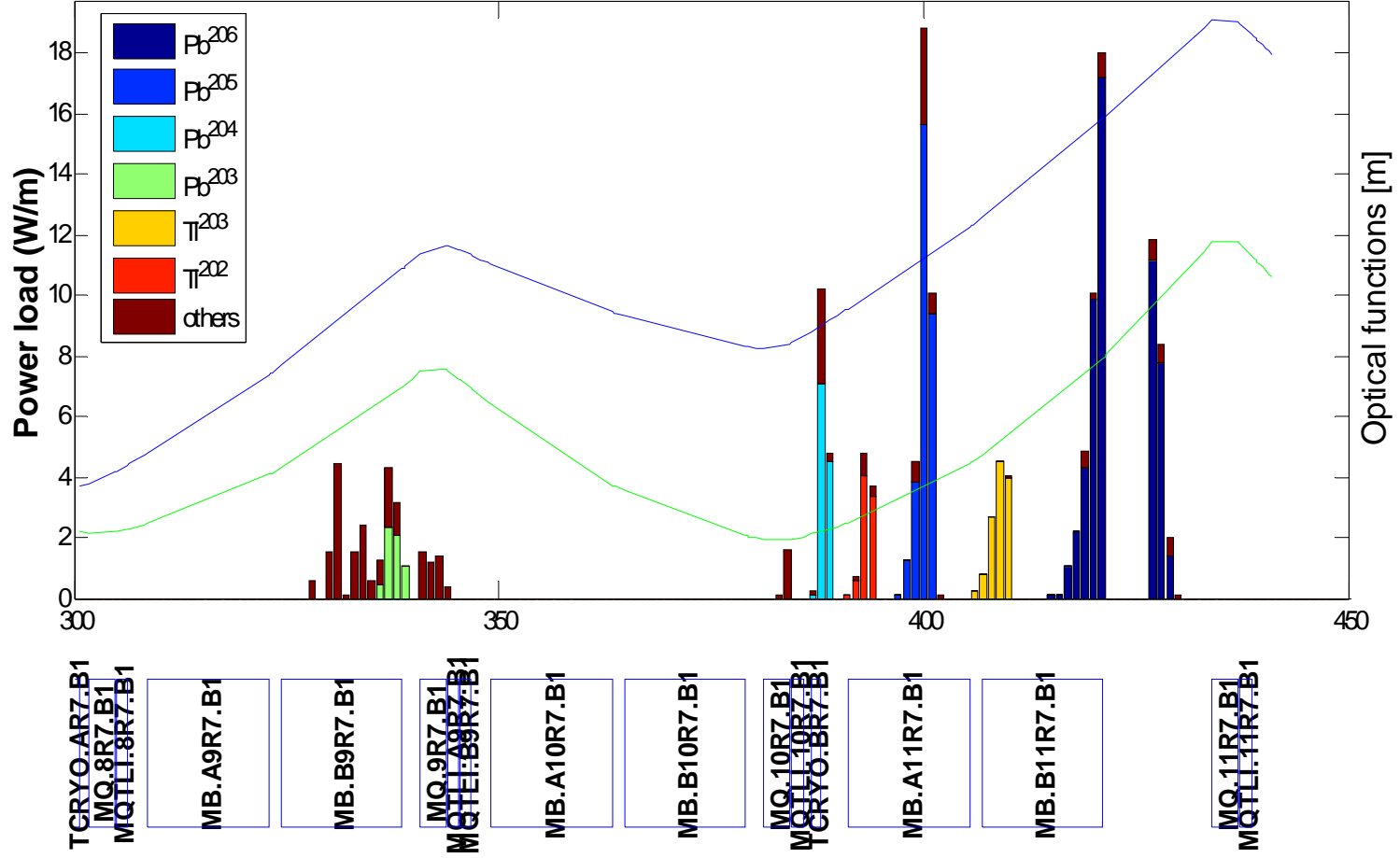
# Phase optics + collimators (TCRYOs retracted)

$\eta = 0.0311$

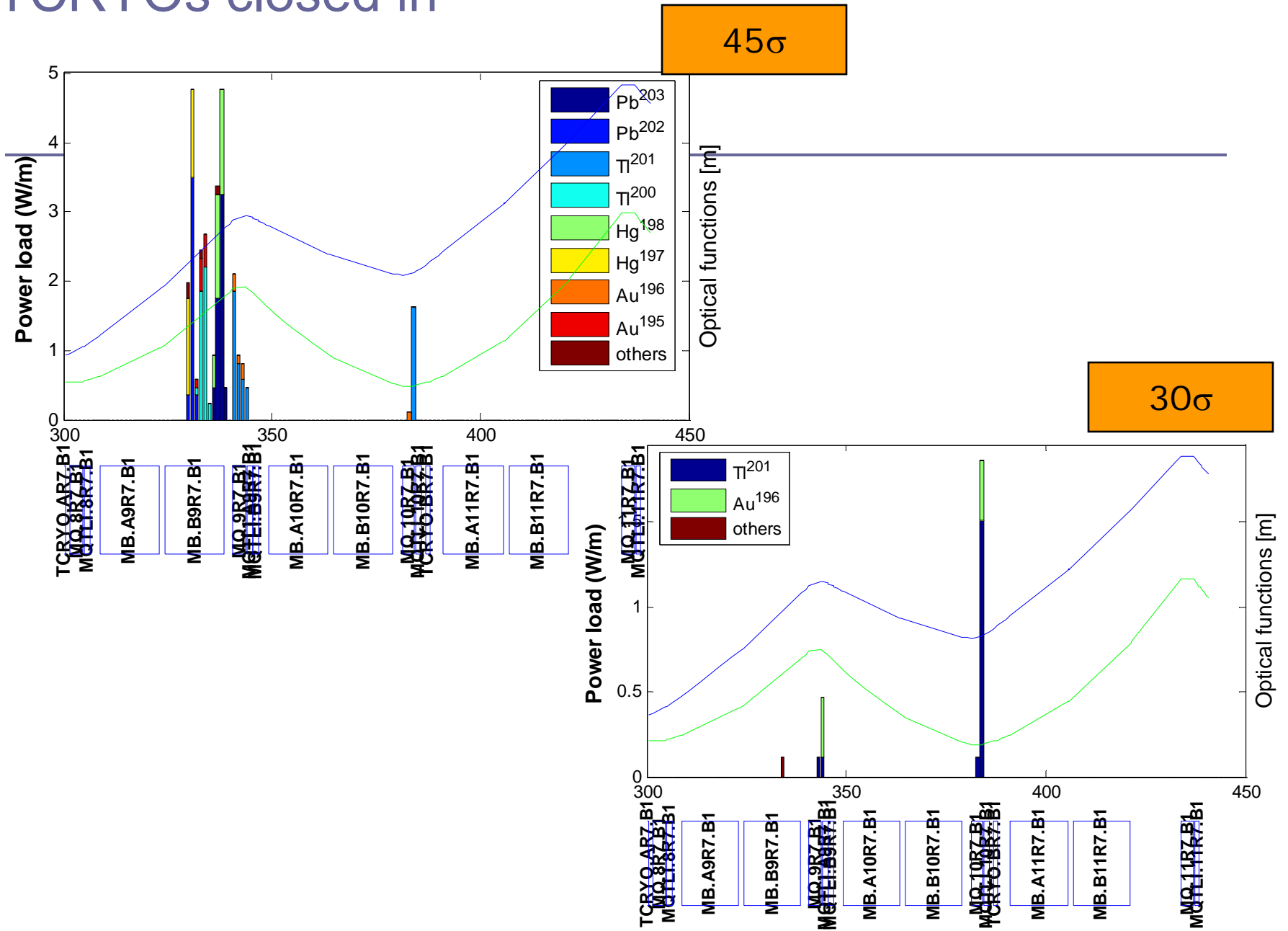




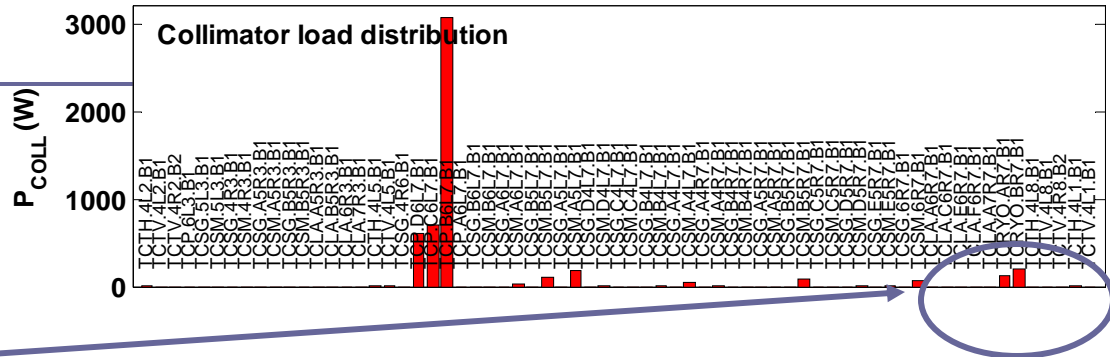
cont'd



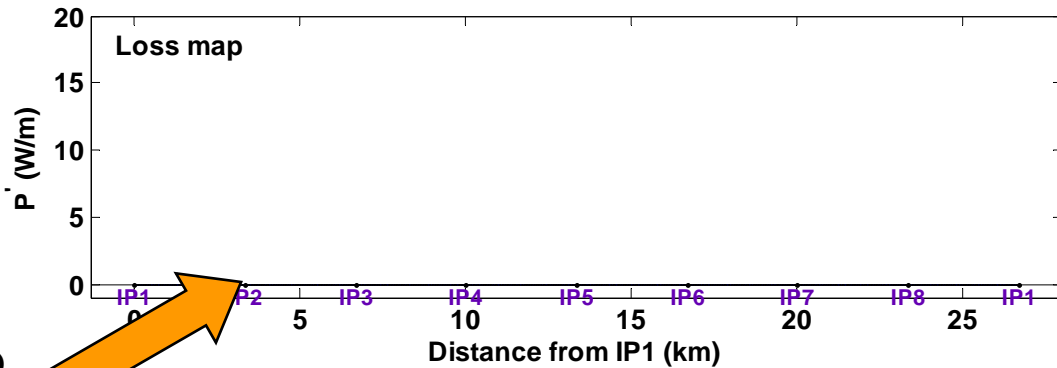
# TCRYOs closed in



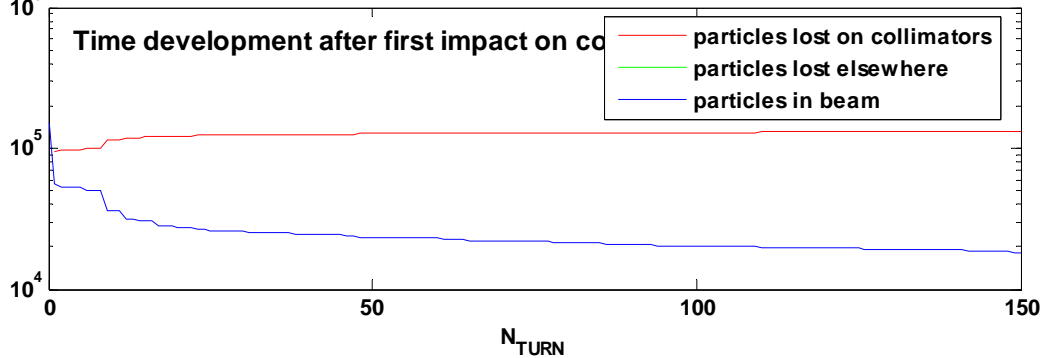
# TCRYOs at $15\sigma$



Load on TCRYOs



<  $25\sigma$  no losses in the machine aperture! (for up to 150k particle statistics..)



# conclusions

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- Exploratory study very promising
- Assess feasibility of changes in IR7
- Repeat simulations for beam2
- Optics not properly rematched
- Studied for ideal machine only, need to check performance with imperfections added
- Investigate similar approach for momentum cleaning in IR3
- Heat load on cryogenic collimators?