

ILC08 BDS Conveners

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ILC08 BDS-MDI Session Schedule

	8:30-10:00	10:30-12:00	13:30-15:30	16:00-18:00
Monday Nov. 17	min.machine, collimation,vac.	ATF2,CLIC, Brett, Font	joint : MDI ILD talk	LowP, TF, Monalisa etc.
Tuesday Nov. 18	ATF-ICB	Joint : $\gamma\gamma$, MDI	MDI, GP++, beamst. Joint: CFS, DR min.machine	Joint : CFS, DR min. machine
Wednesday Nov. 19	Joint : MDI support, PM, permanent FD	Joint : MDI IR doc., RD, post-Lol	Joint : MDI Pol., BDS changes, LM,	Summary preparation LCWS Plenary

Low power option special session ?

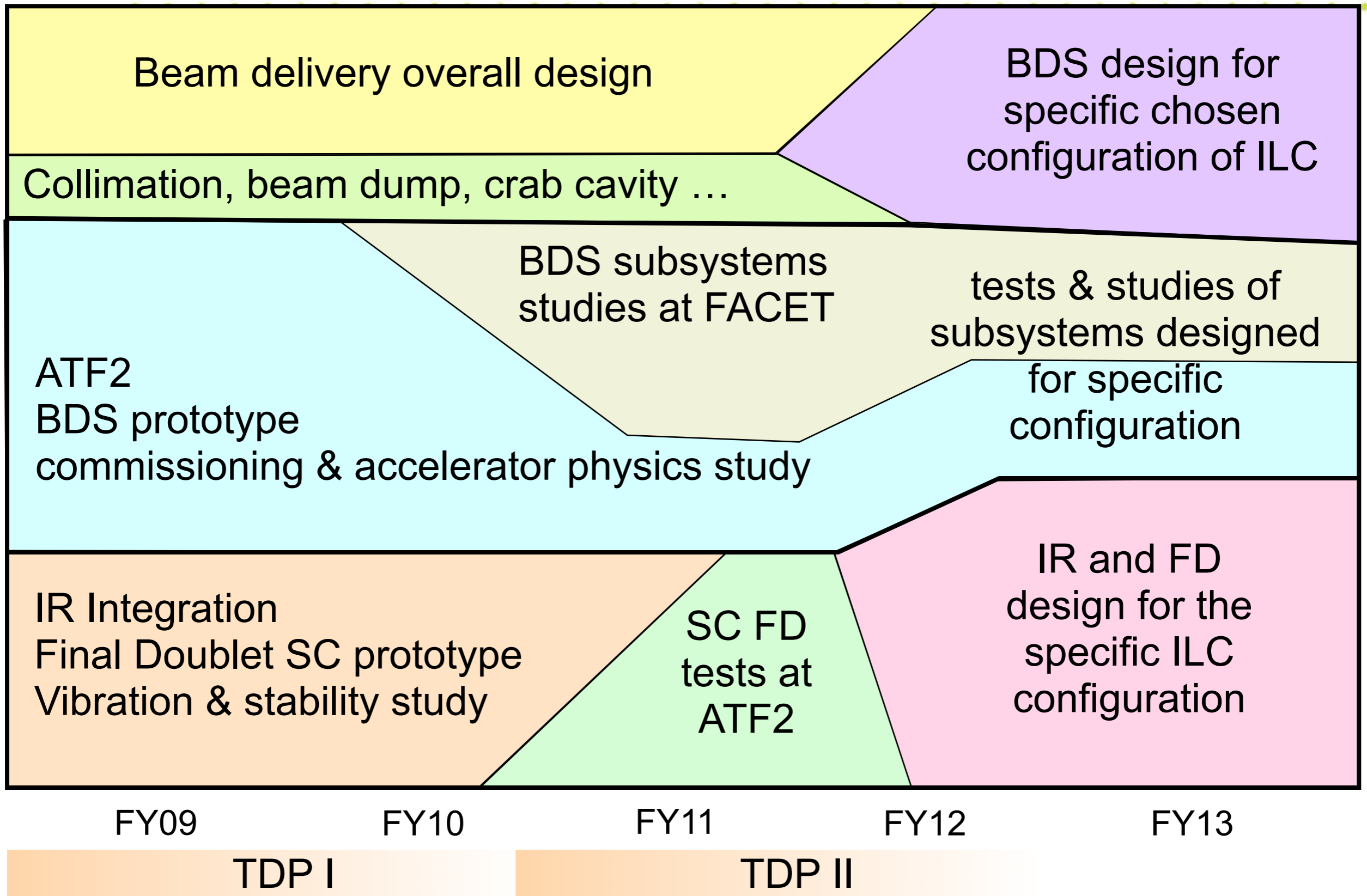
CLIC session ? , summary of CLIC08 workshop

Minimum machine configuration session with MDI or detectors ?

Joint with MDI : push pull (platform, QF1 position, IR hall), longer L*,
IR interface document



BDS plans





New developments in ILC design

- A “minimal machine” is being investigated
 - It includes various cost saving ideas
 - e.g. rearrangements of beamlines in central region
 - AND a lower power option, but improved one, with better performance for physics
 - This new low P option may use tighter focusing at IP and **traveling focus**.
 - Are there ways to study these IP conditions at ATF2?
 - Could traveling focus be arranged? And if yes, could it be detected without second beam?



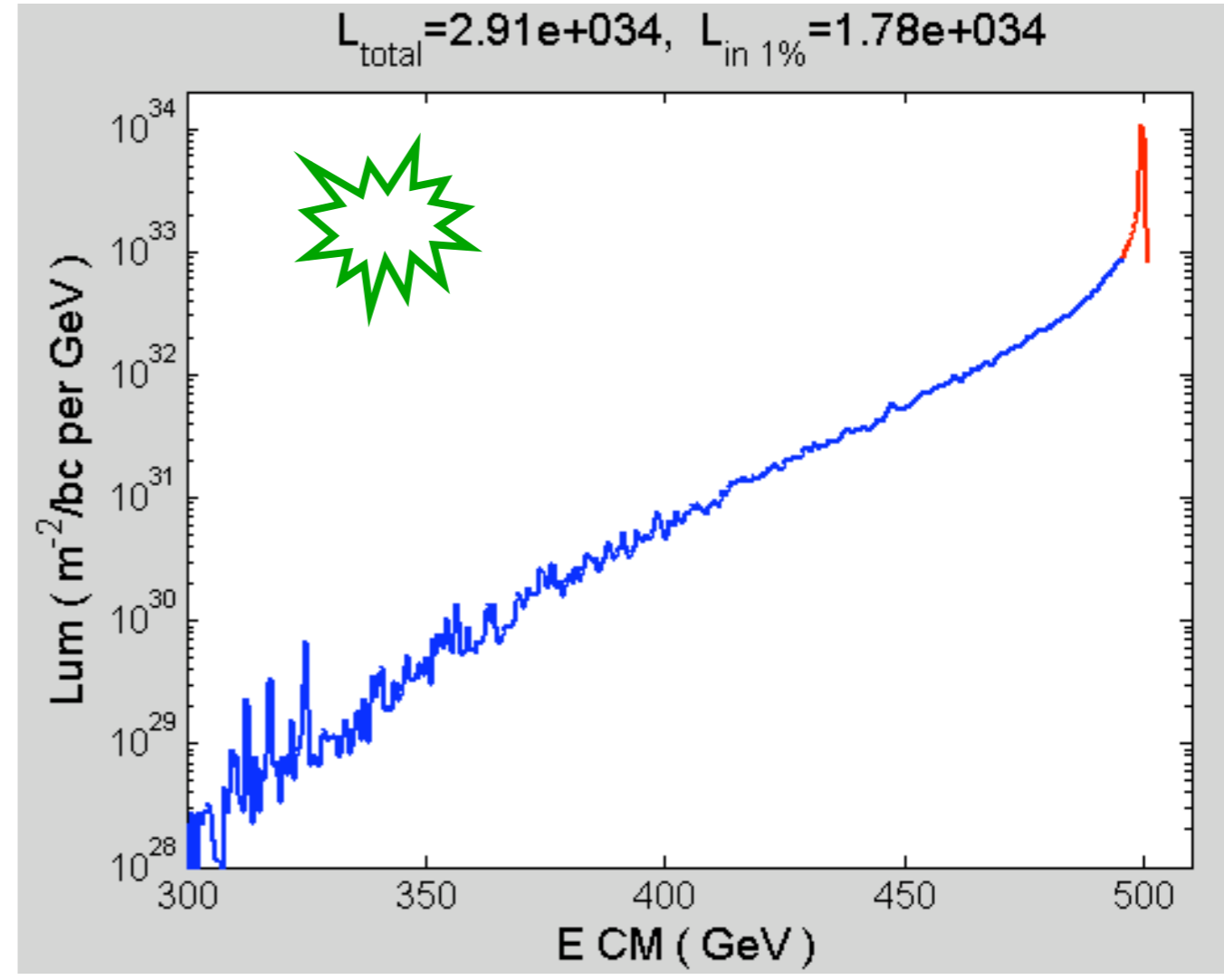
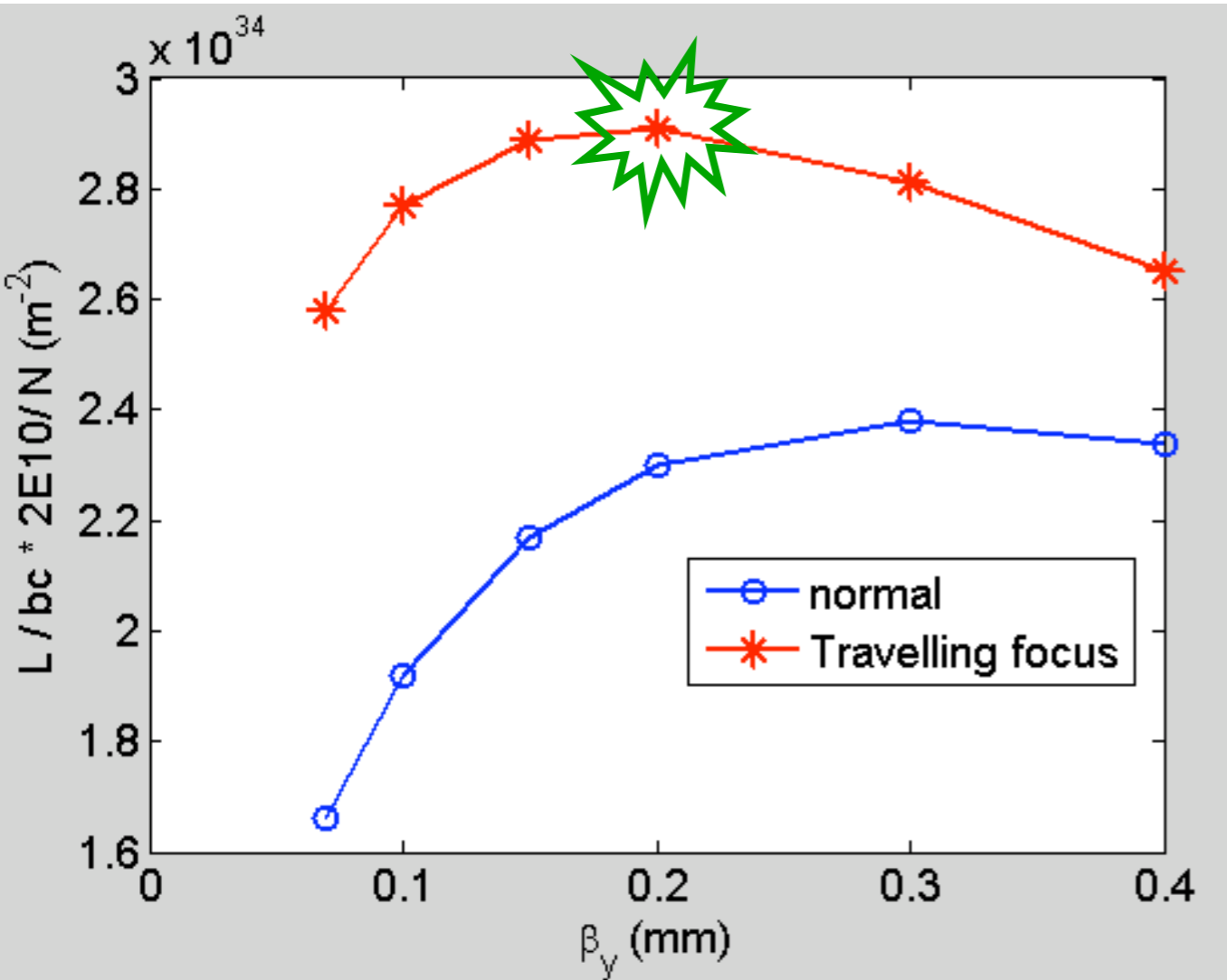
Comparison of parameter sets

	Nom. RDR	Low P RDR	new Low P	new Low P	new Low P	new Low P
Case ID	1	2	3	30	4	5
E CM (GeV)	500	500	500	500	500	500
N	2.0E+10	2.0E+10	2.0E+10	2.0E+10	2.0E+10	2.0E+10
n_b	2625	1320	1320	1320	1105	1320
F (Hz)	5	5	5	5	5	5
P_b (MW)	10.5	5.3	5.3	5.3	4.4	5.3
$\gamma\epsilon_x$ (m)	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
$\gamma\epsilon_y$ (m)	4.0E-08	3.6E-08	3.6E-08	3.6E-08	3.0E-08	3.0E-08
β_x (m)	2.0E-02	1.1E-02	1.1E-02	1.1E-02	7.0E-03	1.5E-02
β_y (m)	4.0E-04	2.0E-04	2.0E-04	1.0E-04	1.0E-04	1.0E-04
Traveling focus	No	No	Yes	Yes	Yes	Yes
Z-distribution *	Gauss	Gauss	Gauss	Flat	Flat	Flat
σ_x (m)	6.39E-07	4.74E-07	4.74E-07	4.74E-07	3.78E-07	5.54E-07
σ_y (m)	5.7E-09	3.8E-09	3.8E-09	2.7E-09	2.5E-09	2.5E-09
σ_z (m)	3.0E-04	2.0E-04	3.0E-04	3.0E-04	5.0E-04	2.0E-04
Guinea-Pig $\delta E/E$	0.023	0.045	0.036	0.036	0.039	0.038
Guinea-Pig L (cm ⁻² s ⁻¹)	2.02E+34	1.86E+34	1.92E+34	1.98E+34	2.00E+34	2.02E+34
Guinea-Pig Lumi in 1%	1.50E+34	1.09E+34	1.18E+34	1.17E+34	1.06E+34	1.24E+34

*for flat z distribution the full bunch length is $\sigma_z * 2 * 3^{1/2}$



Case 3: better Low P, with TRAV_FOCUS

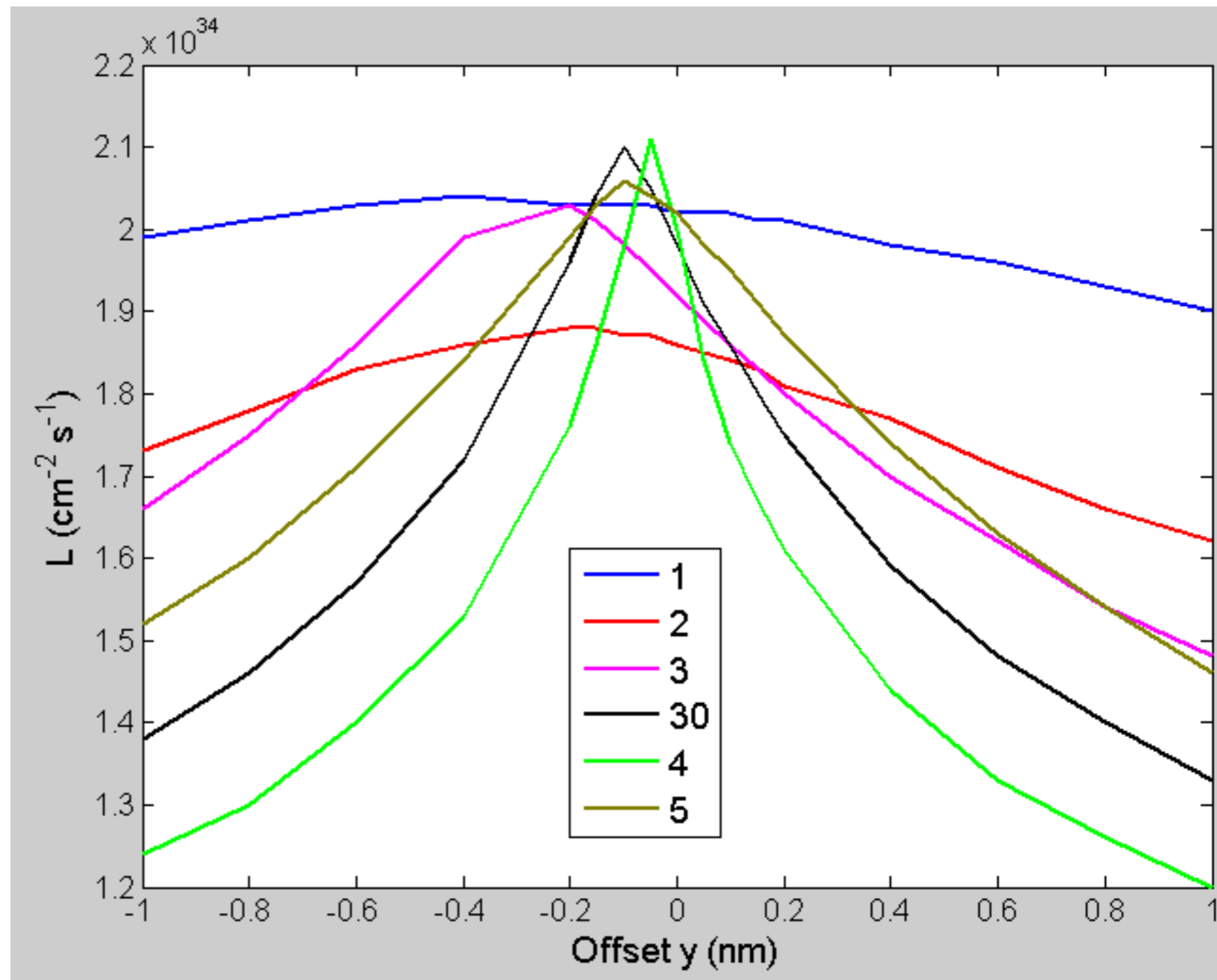


par	E	N	B_X	B_Y	S_Z	E_X	E_Y	DISTZ	TRFOC	NB_FREQ
3	250	2	11	0.2	300	10	0.036	0	1	6600
L (tot,		in 1%)		dE/E	Ymax					
1.92e+034		1.18e+034		0.0356	0.243					

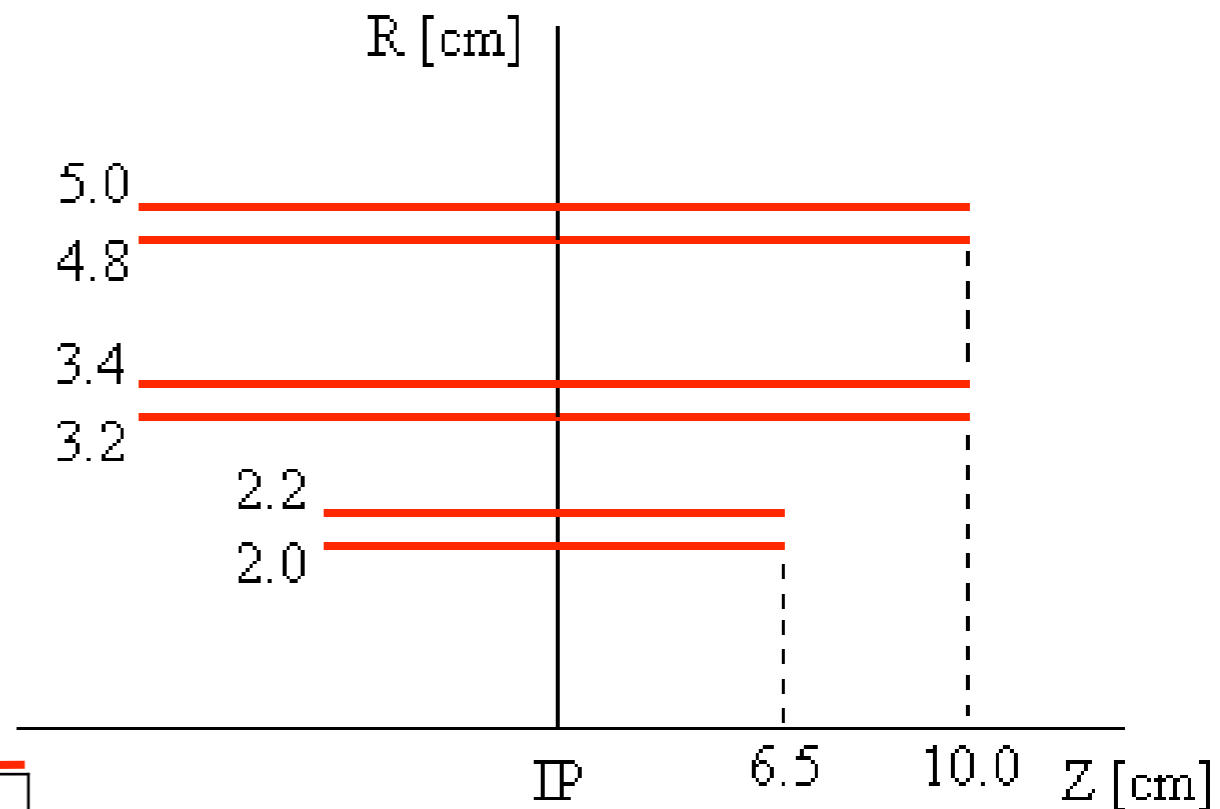


Higher sensitivity to offset

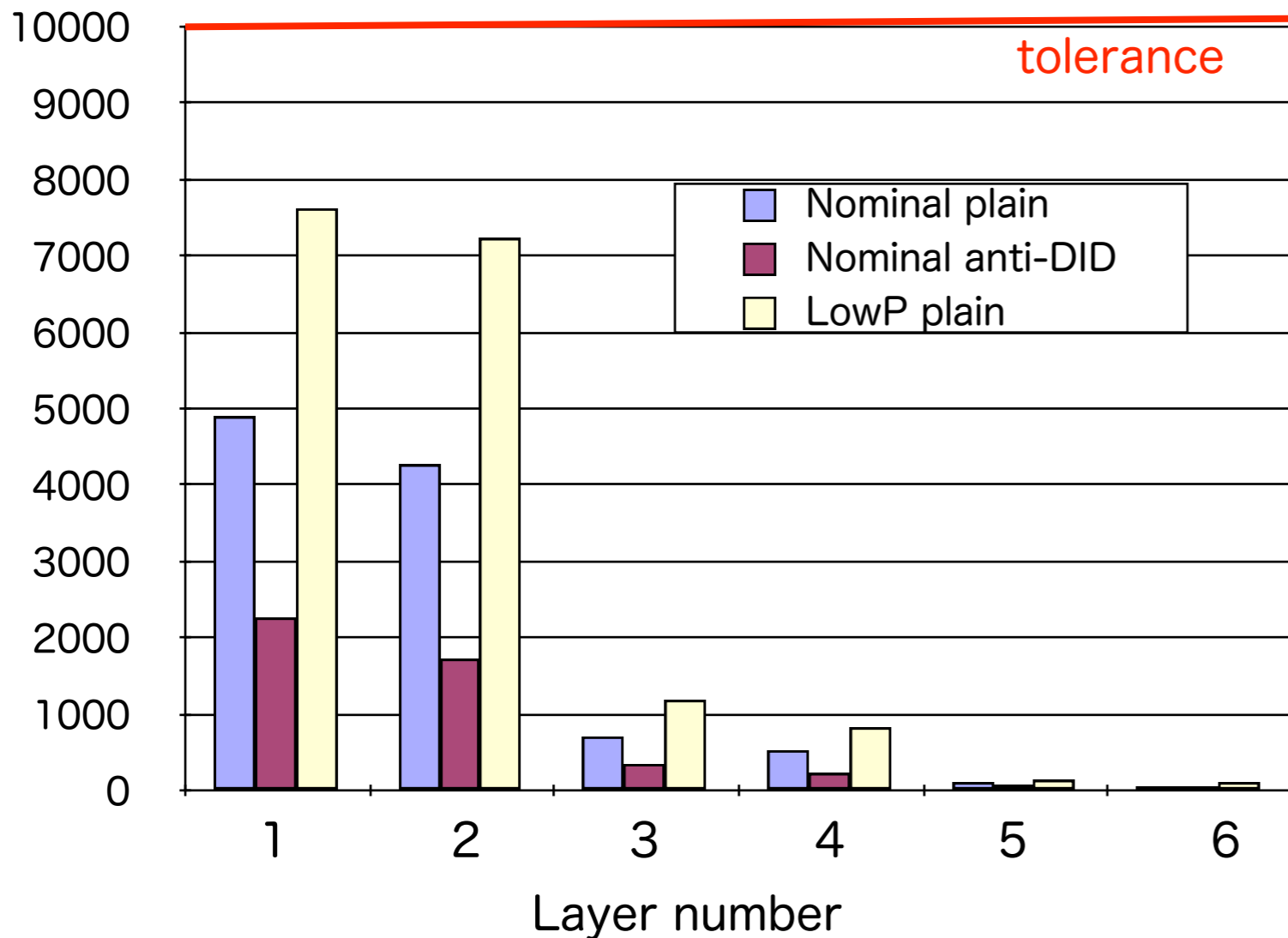
- In traveling focus case, higher disruption is needed for the bunches to keep focusing each other
- It then produces higher sensitivity to offset of the beams
- Operation of intra-train luminosity optimization is more challenging



VTX hit distribution



hits/cm²/train

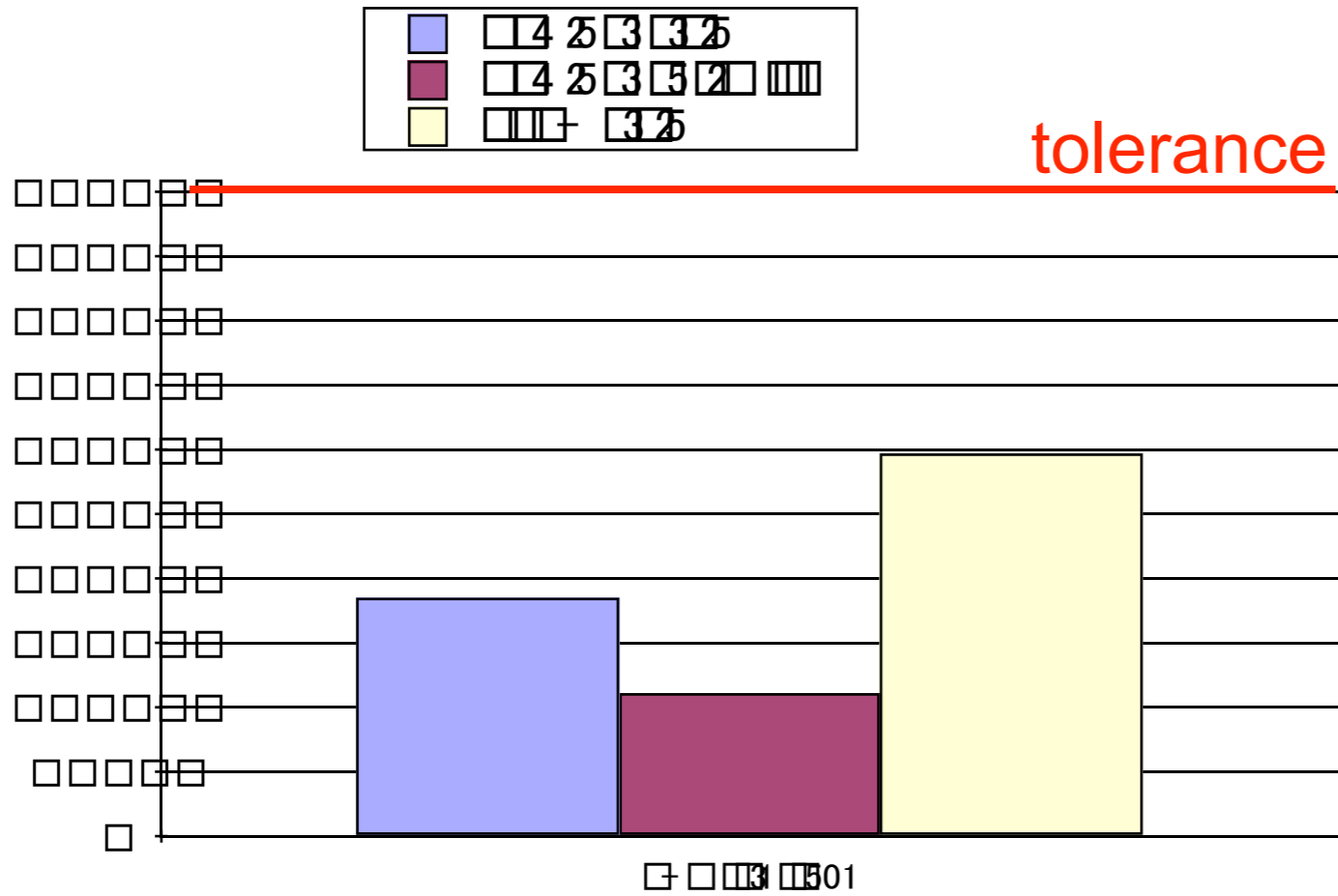


Nominal plain: 20 bunch

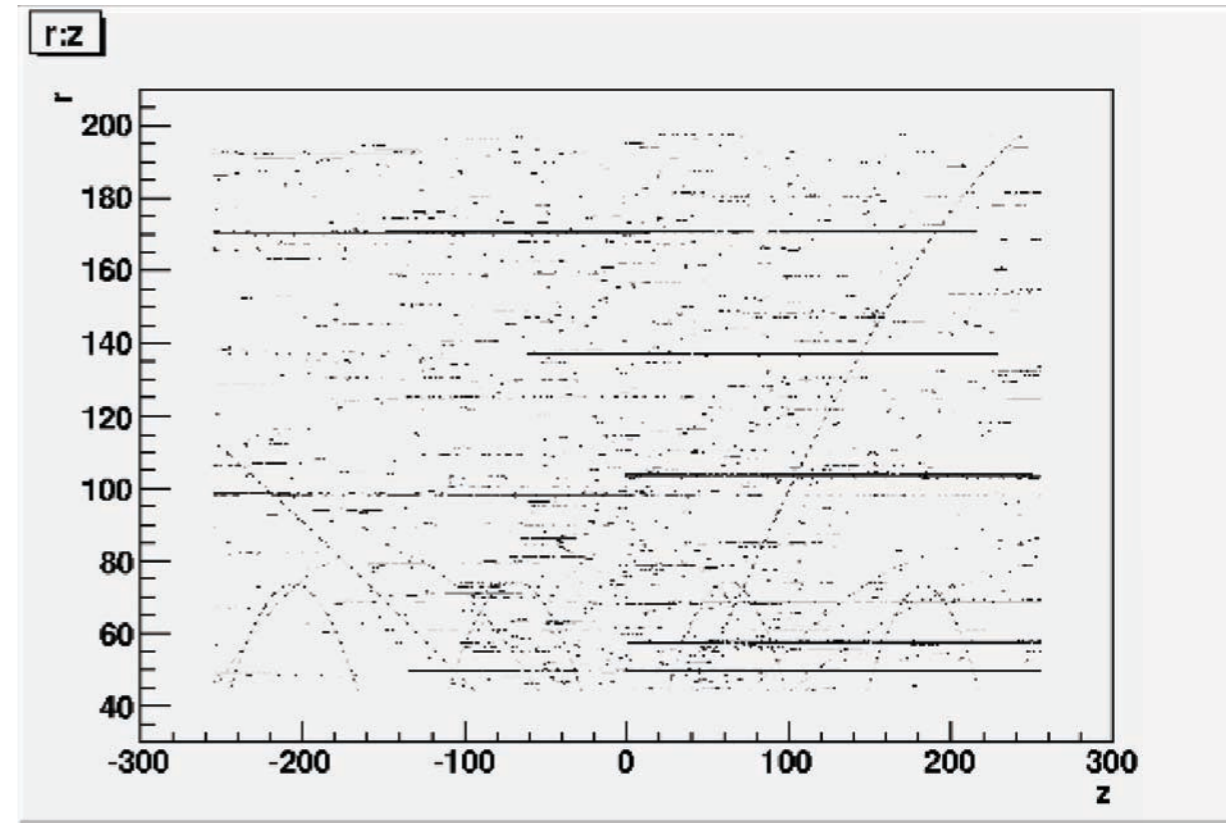
Nominal anti-DID: 10 bunch

Low P plain: 1 bunch

TPC hit



TPC digital hits

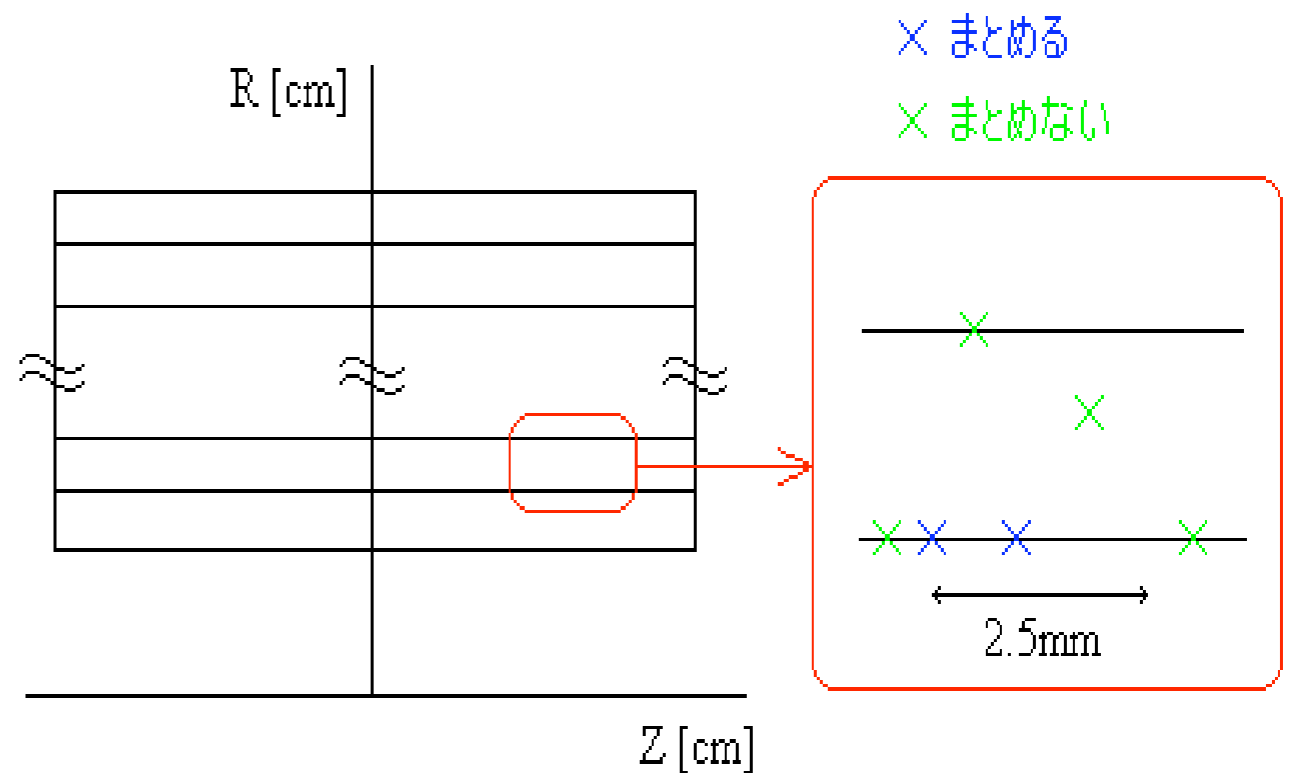


TPC Exact hits

Nominal plain: 20 bunch

Nominal anti-DID: 10 bunch

Low P plain: 1 bunch

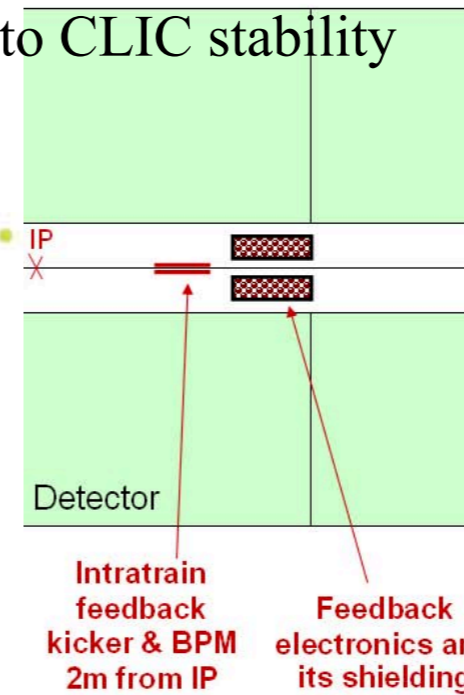


Longer L^* study

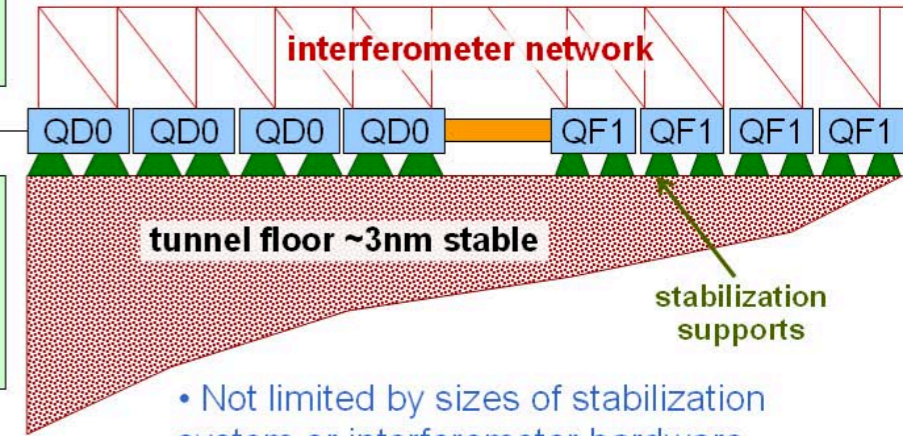
- Study of higher chromaticity optics at ATF2
 - smaller β^* or
 - longer L^*

- may be interesting for studies of simplified IR interface
- and for possible studies of CLIC BDS

Discussed approach to CLIC stability

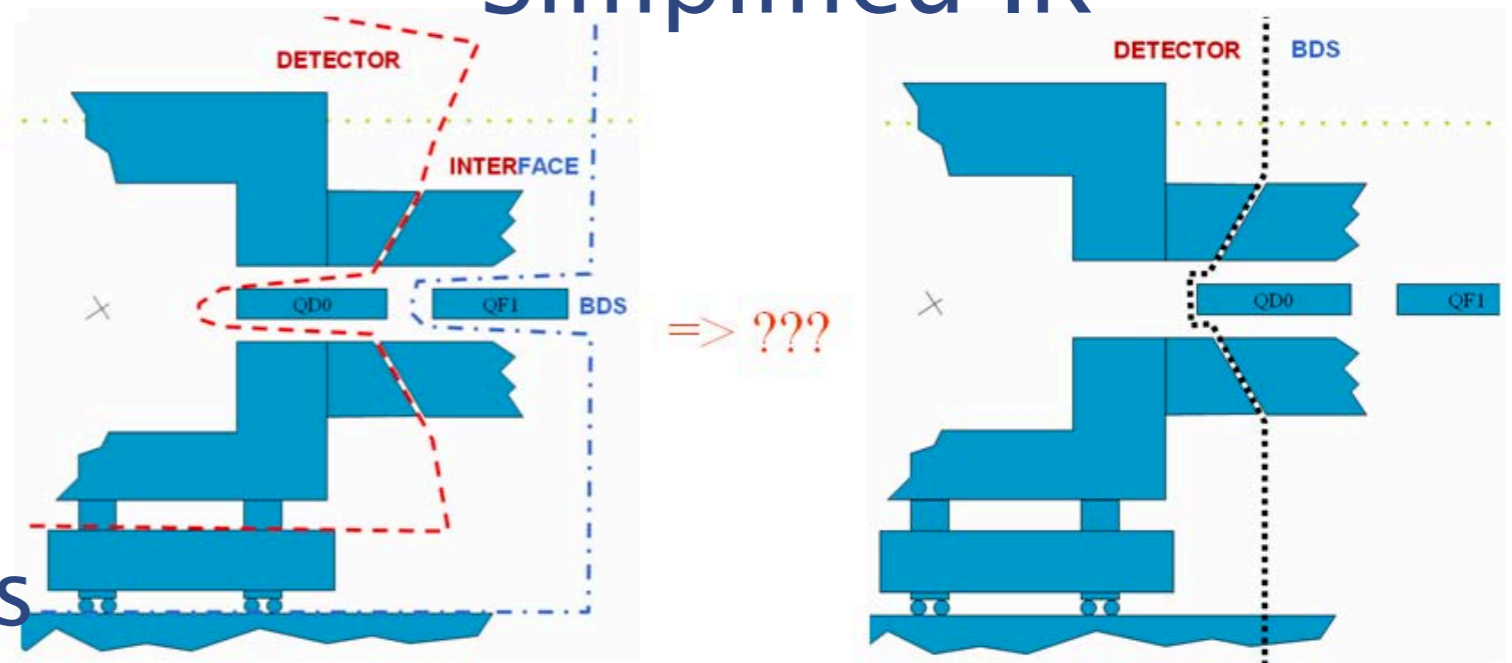


- Slower than $1/L^*$ dependence of $Lum \Rightarrow \uparrow L^*$
- Reduced feedback latency – several iteration of intratraining feedback over 150ns train
- FD placed on tunnel floor, which is ~ten times more stable than detector – easier for stabilization



- Not limited by sizes of stabilization system or interferometer hardware
- Reduced risk and increased feasibility
- May still consider shortened L^* for upgrade

Simplified IR



- Longer L^* , long enough to have QD0 outside of detector, separating M/D more cleanly and simplifying push-pull
 - Some impact on luminosity is unavoidable; R_{vx} may need to be increased
- If a longer L^* design will be found viable, a question will be
 - whether to consider it as a permanent solution
 - if a Luminosity upgrade, by shortening the L^* , would be considered later, after operational experience will be gained with a simpler system