

GDE @ Albuquerque

SB2009

Yokoya

2009.10.19 LC定例

SB2009

- Single-tunnel (Main Linacs+RTML), with two possible variants for the HLRF
 - Klystron cluster scheme
 - DRFS scheme
- バンチ数半減 $nb = 1312$
- Damping Ring周長半減 (3.2 km)
 - バンチ長6 mm
- Single-stage bunch compressor
 - compression factor は20まで
- e+ source → undulator を電子リナック後尾へ(250 GeV)
 - Capture device: Quarter-wave transformer
 - Low energy scheme は決められていない。Barryの決断待ち
Undulator 長?
- 中央部レイアウトの最適化
 - Tunnel length reduction 27km in total

SB2009 Parameters (WA)

		RDR	SB2009		
Beam and RF Parameters					
No. of bunches		2625	1312		
Bunch spacing	ns	370	740		
beam current	mA	9.0	4.5		
Avg. beam power (250 GeV)	MW	10.8	5.4		
Accelerating gradient	MV/m	31.5	31.5		
P_{fwd} / cavity (matched)	kW	294	147		
Q_{ext} (matched)		3×10^6	6×10^6		
t_{fill}	ms	0.62	1.13		
RF pulse length	ms	1.6	2.0		
RF to beam efficiency	%	61	44		
IP Parameters					
Norm. horizontal emittance	mm.mr	10	10		
Norm. vertical emittance	mm.mr	0.040	0.035		
bunch length	mm	0.3	0.3		
horizontal b^*	mm	20	11		
horizontal beam size	nm	640	470		
				no trav. focus	with trav. focus
vertical β^*	mm	0.40	0.48	0.2	
vertical beam size	nm	5.7	5.8	3.8	
D_y		19	25	21	
dE_{BS}/E	%	2	4	3.6	
Avg. P_{BS}	kW	260	200	194	
Luminosity	$\text{cm}^{-2}\text{s}^{-1}$	2×10^{34}	1.5×10^{34}	2×10^{34}	

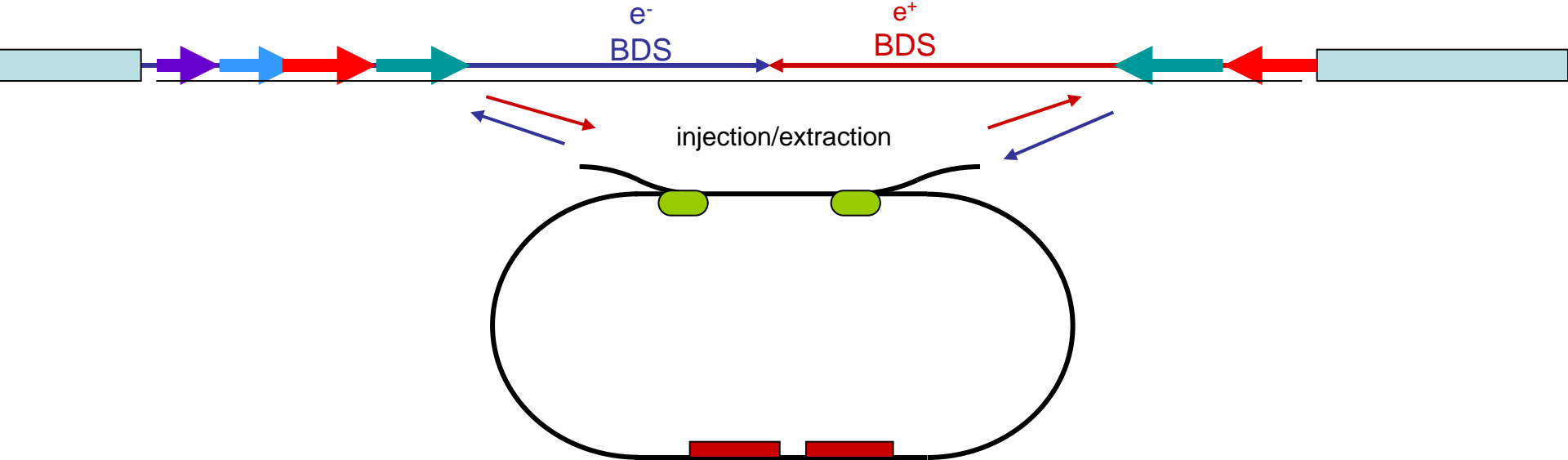
Central Region Integration

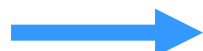



5 GeV Boosters share tunnel with BDS

E- Gun and injector share tunnel with BDS

Undulator + Aux Injector + E+ Tgt-Capture-Accel + Booster share tunnel with BDS

No Keep Alive source and two tunnels, beam + support



-  Undulator
 -  E+/- Warm Accel
 -  E+ Tgt + Capture + Accel
 -  5GeV Injector Booster
- e⁺ wiggler and rf e⁻ wiggler and rf

加速勾配

- Database team 設立、活動中
 - Yieldの定義の確立
- おおきなgradient spreadを許容する方向（～20%?）
 - DRFS, KCSともOKと言っている
- 平均勾配31.5MV/mは堅持する方向
 - あとで修正してもシステムに大きな変化はない

SB2009 Estimate Differentials - ABQ

- **6,610 M** ILCUs – corrected Americas starting point
- Some minor differentials are not yet available in below info

Possible Action

Impacts (M ILCUs)

CFS components total

Value Eng Cooling for ML

ML Klystron Cluster (1 tunnel)

ML Klystron Cluster – Low P

3.2 km DR – Low P

Central Region Optimization

possibilities so far (~ 2/3 CFS)

DRFS 1 tunnel & Low P

not available yet

Remember: these are just inputs to GDE management for consideration of whether to pursue these proposed actions

Luminosity Upgradeの可能性

- 最大x2のluminosity増強
 - バンチ数 x2
 - Klystronなどの増強
- Challenges
 - Damping ring kicker
 - Electron cloud

Next Steps (2009)

- GDE focus this meeting will be to consolidate SB2009 Working Assumptions
 - Review action items and outstanding issues from DESY meeting
 - Produce a first-guess estimate of cost increments
 - Begin to prepare **Proposal Document**
 - Chief editor 峠
- AD&I meeting 2-3.12 (DESY)
 - 1st draft of Proposal Document
 - Resolve remaining WA issues
 - Including designated representatives from Physics & Detector community
- Proposal Document final draft made public 18.12.09
 - Formally to Director/EC, Forwarded to AAP
 - Entire community for comment/feedback

Outline of the Proposal Document

1.	Introduction	PM	2 pages
2.	SB2009 Overview	PM	4 pages
3.	SB2009 Layout	JMP	
4.	SB2009 Proposal (TAG leaders)		
1.	Parameters	PM	2 pages
2.	Gradient Issues	PM (AY)	2 pages
3.	Injectors	JC	2 pages
4.	Damping Rings	SG	2 pages
5.	Bunch Compressors	NS	2 pages
6.	Main Linac		
1.	Single Tunnel (Technical) Solution	VK	2 pages
2.	DRFS	SF	2 pages
3.	KCS	Chris	2 pages
7.	BDS/MDI	AS	2 pages
8.	CFS solutions	VK	4 pages
5.	Cost Increments/differentials (PHG)		2 pages
6.	Risk	PMs	2 pages
•	Appendices		
1.	Report from Availability Task Force	TMH	
2.	Report(s) on Tunnel Safety Concepts	CF/PMs	
3.	Risk analysis ... (here, or embed elsewhere)		

~30
pages

Probably
end up
with 50-
60

Next Steps (2010)

- AAP formal review (4-6.01.10)



Review/include feedback from
AAP and ILC community

- Final establishment of TDP-2 ILC baseline
at LCWS (Beijing, 26-30.03.10)



Preparation / planning for
TDP-2 activities

- Presentation of new baseline at ICHEPP
(Paris, 07.10)

Formal start of TDP-2