



# LCWA09 DR Session Introduction

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LCWA09, 30 September 2009



## DR session at LCWA09

- **Update R&D and TDP plans**
  - Process from e-cloud R&D results to DR design (choice of mitigation techniques)
  - Startup of e-cloud working group
- **Discussion of new Baseline choice SB2009**
- **Presentations on R&D and Design work**
- **CesrTA test facility**
  - Results of the last running period
  - Planning



## AD&I meeting at DESY

- From the Summary Report:
  - A discussion on the ‘upgrade’ potential from the SB2009 proposed 1312 bunches back to the current RDR nominal value of 2623 (doubling the current ) immediately identified bottlenecks.
  - The Working Assumption is to continue with the 3.2km option, but attempt to quantify the current limits due to e-cloud (on-going R&D).
- **Action Items for DR**
  - For 3.2km ring, what are the estimated limits on bunch charge and number?
  - Update risk register (bunch distance and current)



## Number of bunches and Circumference

	Baseline TILC08	SB2009
# of bunches	2610 - 5265	1305 - 2632
Bunch population $N_b$	$2 - 1 \cdot 10^{10}$	$2 \cdot 10^{10}$
Bunch distance (ns)	6.2 - 3.1	6.2 - 3.1
C (m)	6476	3238
h	14042	7021
Kicker freq MHz (1ms linac pulse)	2.7 - 5.4	1.4 - 2.7

For 2632 bunches  $N_b = 2 \cdot 10^{10}$



# RDR Risk analysis

Concern		RISK	COST	r*C	MITIGATION
(1) Secondary Emission Yield too high. >1.2	Q	High	200	100	Return to two e+ ring design after extensive R&D programs
(2) Vacuum system design not robust		Med	20	5	Redesign vacuum system with more distributed pumping
(3) High impedance of vacuum chamber components		Med	10	3	More engineering design or DR re-optimization
(4) RF Margin	Q	Med	50	13	Increase klystron/cavity system by 50%
(5) Combination of concerns with RF and Wiggler layouts	Q	Med	100	25	Increase in number of shafts and alcoves
(6) Plan for having room for future double ring, later decision	Q	Low	20	2	Increase tunnel diameter and include above (5)
(7) General concern with injection/extraction kicker performance		Med	20	5	Increase no of kicker units and/or restrict parameter ranges

Needs  
Update

Concern	COMMENTS/NOTES	UPDATES (my evaluation)	
(1) Secondary Emission Yield too high. >1.2	Assumes CF&S designs have been changed to allow this possibility. Ref JMP 3/27/07	Mitigation Techniques can lower e-cloud density below instability threshold. Effect of MT on vacuum system design, cost and impedance not yet evaluated, see 2,3.	Very low
(2) Vacuum system design not robust	Early decision is less expensive and less impact on other systems Ref JMP 3/27/07	Present vacuum system design includes antechamber in dipoles (1) and more pumping speed. Cost will be available in few weeks.	High
(3) High impedance of vacuum chamber components	Could be input to review of design parameter range Ref JMP 3/27/07	recent estimates indicate that nominal parameters are below the thresholds for microwave and other instabilities	Very low
(4) RF Margin	Coupled with items 5,6, has large impact on CF&S Ref JMP 3/27/07	Not needed since momentum compaction has been reduced	Very low
(5) Combination of concerns with RF and Wiggler layouts	CF&S impact coupled with 4,6 Ref JMP 3/27/07	risk of 4,6 is reduced	Med
(6) Plan for having room for future double ring, later decision	Ref JMP 3/27/07	double ring is unlikely	Very low
(7) General concern with injection/extraction kicker performance	Ref JMP 3/27/07	1 kickers satisfy most specifications but still there are concerns on the reliability. The cost per unit should be lower.	Med



## e-cloud: from R&D results to DR design

- A working group, coordinated by an expert, defines the work/resources needed for a reliable evaluation and assigns the tasks to the available resources.
- At the conclusion of the work the results will be discussed at a DR meeting and a selection procedure will be setup in order to arrive to a widely accepted decision.
- Thursday 1 October 15:00: **WG assessment and plans**



# DR - Lattice and fast kickers

<i>Wednesday 30 September 13:30 - 15:30</i>		
13:30	S. Guiducci	Introduction
13:40	M. Korostelev (Webex)	RDR Lattice Update
14:10	J. Urakawa	Status of ATF fast kicker experiment



# DR - e-cloud and fast ions

Thursday 1 October 8:30 - 15:30

<b>e-cloud and fast ions</b>		Conveners Mark Palmer and Mauro Pivi
8:30	M. Pivi	Intro & SLAC update
8:55	Y. Suetsugu	KEKB update
9:15	R. Zwaska (WebEx)	FNAL update
9:35	tbd	CERN update
9:55	T. Demma	INFN update
10:15	coffee break	
10:30	N. Terunuma	Fast Ion Instability Studies at ATF
10:50	S. De Santis	LBNL update and TE Wave
11:10	M. Wendt	TE Wave at FNAL
11:25	L. Wang	Long lifetime electron in non-uniform magnetic field
11:40	M. Palmer	CesrTA Status
12:00	lunch	
13:30	G. Dugan	CesrTA EC Simulations
14:10	J. Calvey	Mitigation Studies
14:30	All	CesrTA Planning Discussion
15:00	All	WG Assessment and Plans





# DR - SB2009 and Technical Design

*Thursday 1 October 16:00 - 17:30*

<b>SB2009 and Technical Design</b>		Convener Susanna Guiducci
16:00	S. Guiducci/M. Biagini	SB2009 lattice update
16:20	N. Collomb	DR Layout and Mechanical Design
16:50	All	Plans for risk assessment, technical design, cost



# DR - Low emittance tuning

*Fryday 2 October 8:30 - 12:00*

<b>Low Emittance Tuning</b>		Conveners Mark Palmer and Junji Urakawa
8:30	M. Billing	CesrTA Optics and LET
9:10	D. Peterson (webex)	CesrTA X-Ray Beam Size Monitor
9:30	S. Kuroda	ATF plans in emittance tuning
10:00	coffee break	
10:30	M. Wendt	BPMs update
10:50	Y. Papaphilippou	CLIC Damping Ring Update
11:20	Y. Papaphilippou	Plans to reduce horizontal emittance at ATF DR

Strengthening ILC-CLIC collaboration

We are planning a join meeting on January