ILC-10 / LCWS-10 Joint Plenary

GDE Summary

Akira Yamamoto, Marc Ross, and Nick Walker

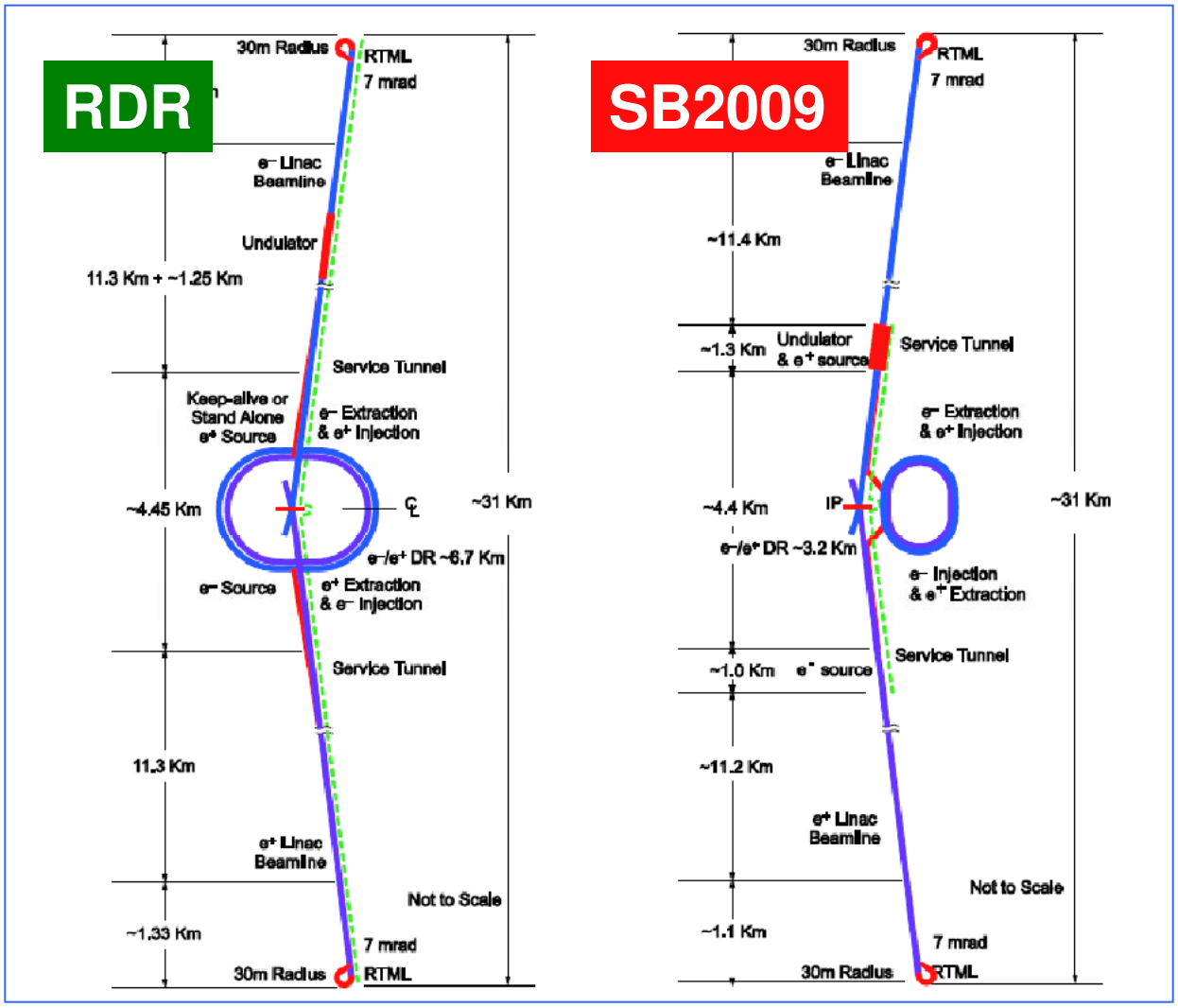
ILC-GDE Project Managers

Beijing, March 30, 2010

Outline

- **What to have been worked in ILC10?**
  - Key themes in SB2009, and
  - Communication with Physics/Detector Groups
- **Where we have reached?**
  - Cavity Gradient, Single Tunnel,
  - Low Power Parameters, e+ Source location
    - A solution to keep a higher luminosity
- **What we plan, further?**
  - Process for Consensus with Phycis/Detector,
  - Proposal for Top Level Change Control
- **Summary**

Proposed Design Changes for TDR



- Single Tunnel for main linac
- Move positron source to end of linac ***
- Reduce number of bunches factor of two (lower power) **
- Reduce size of damping rings (3.2km)

- Integrate central region
- Single stage bunch compressor

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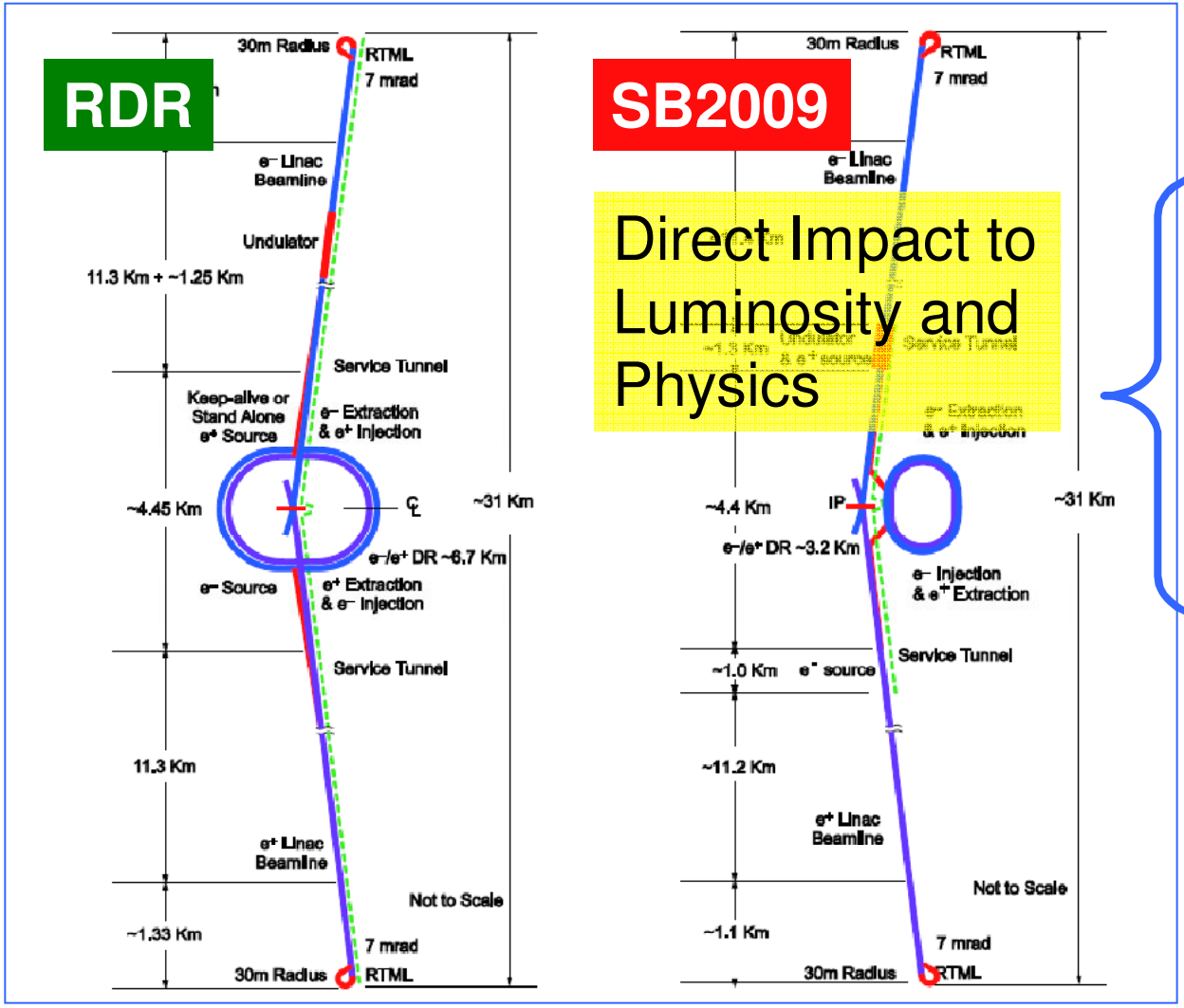

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ILC-10 : PM's (Nick's) Introduction

- **What's expected from the WG?**
  - Review of the R&D status (esp. R&D Plan milestones)
  - How will R&D results factor into ILC baseline?
    - And when?
  - ADI activities – how mature are the current designs
    - Special attention to SB2009 themes
    - Catalogue outstanding decisions
    - What remains to be done for the TDR?
  - Overall planning and milestone updates
    - R&D plan release

Detailed planning (action items) for next 6 months
→ October GDE meeting (Geneva)

Top-level planning towards TDR

- **What's expected from the PMs?**
  - Better defined overall schedule and goals (2010+)
  - Change control procedure (SB2009)
  - Outline for Interim Report
  - Schedule/requirements for R&D Plan Update

ILC-10: Focusing in GDE Summary

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ILC10: Working Groups

Special thanks for much effort of conveners!!

- **WG1: Sources**
  - Wei Gai, Tsunehiko Ohmori, Lous Rinolfi
- **WG2: Damping Rings** **<<< Focused**
  - Susanna Guiducci, Mark Palmer, Junji Urakawa
- **WG3: Main Linac / SRF**
  - Hitoshi Hayano, Carlo Pagani, Christopher Nantista
- **WG4: BDS** **<<< Focused**
  - Andrei Seryi, Hitoshi Yamamoto
- **WG5: CFS**
  - Victor Kuchler, Atsushi Enomoto, John A. Osborne
- **WG6: Acc. Physics / Beam Dynamics**
  - Kiyoshi Kubo, Daniel Schulte

BDS: Plan

- **IP parameter optimization**
  - Detailed work on SB2009 study
  - Evaluate double rep rate at low E
- **BDS & MDI coherent plan**
  - Enhance BDS-MDI work
    - IR & Push-pull
    - Stability
    - Connection to CFS
- **ATF2 work**
  - Beam size
  - Stability
  - Upgrades

PM's Question to WGs in ILC10:

1) Is this the correct strategy to achieve the goal of 'cost-constraint' ?

2) How should we improve communication within the GDE and Physics groups)?

3) What are the top concerns you have for achieving the goals outlined in the R D Plan for the TDP – through 2012?

Beam Parameters

	RDR			SB2009 w/o TF				SB2009 w TF			
CM Energy (GeV)	250	350	500	250.a	250.b	350	500	250.a	250.b	350	500
Ne- ($*10^{10}$)	2.05	2.05	2.05	2	2	2	2.05	2	2	2	2.05
Ne+ ($*10^{10}$)	2.05	2.05	2.05	1	2	2	2.05	1	2	2	2.05
nb	2625	2625	2625	1312	1312	1312	1312	1312	1312	1312	1312
Tsep (nsecs)	370	370	370	740	740	740	740	740	740	740	740
F (Hz)	5	5	5	5	2.5	5	5	5	2.5	5	5
γex ($*10^{-6}$)	10	10	10	10	10	10	10	10	10	10	10
γey ($*10^{-6}$)	4	4	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
βx	22	22	20	21	21	15	11	21	21	15	11
βy	0.5	0.5	0.4	0.48	0.48	0.48	0.48	0.2	0.2	0.2	0.2
σz (mm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
σx eff ($*10^{-9}$ m)	948	802	639	927	927	662	474	927	927	662	474
σy eff ($*10^{-9}$ m)	10	8.1	5.7	9.5	9.5	7.4	5.8	6.4	6.4	5.0	3.8
L (10^{34} $cm^{-2}s^{-1}$)	0.75	1.2	2.0	0.2	0.22	0.7	1.5	0.25	0.27	1.0	2.0

Rate at IP = 2.5Hz,
Rate in the linac = 5Hz
(every other pulse is at 150GeV/beam, for e+ production)
Low luminosity at this energy is a concern for Detector colleagues

Beam Parameters & mitigation

	RDR			SB2009 w/o TF				SB2009 w TF			
CM Energy (GeV)	250	350	500	250.a	250.b	350	500	250.a	250.b	350	500
Ne- ($*10^{10}$)	2.05	2.05	2.05	2	2	2	2.05	2	2	2	2.05
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βx	22	22	20	21	21	15	11	21	21	15	11
βy	0.5	0.5	0.4	0.48	0.48	0.48	0.48	0.2	0.2	0.2	0.2
σz (mm)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
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- **(Tentative!) At 250 GeV CM the mitigations may give:**
  - x 2 L due to double rep rate
  - x ~ 1.4 L due to FD optimized for low E

Work on mitigations of L(E)

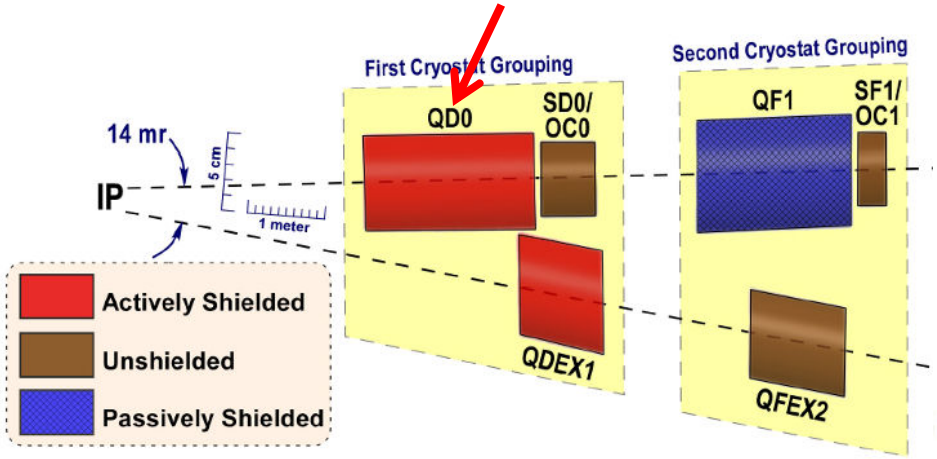
with SB2009 during ILC2010

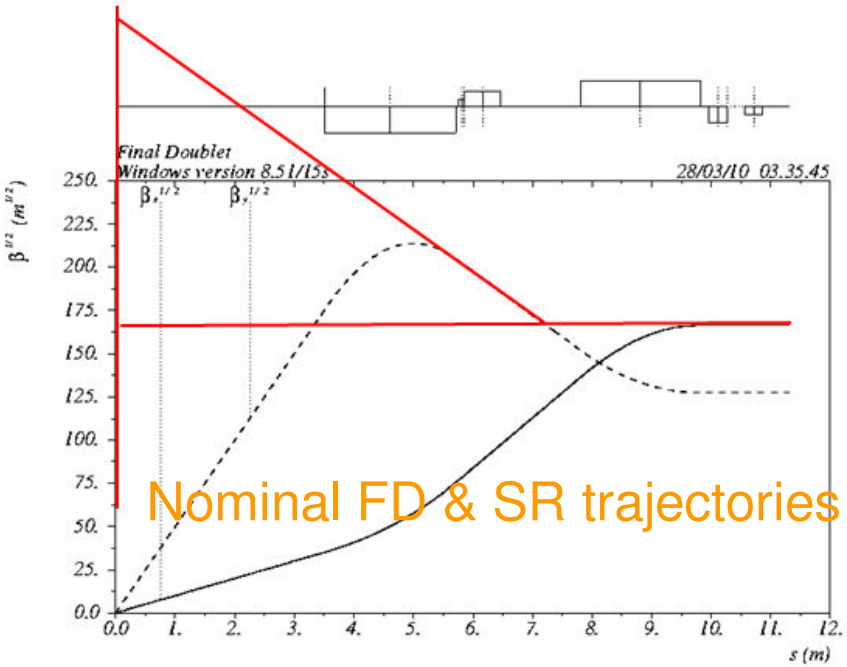
- **Doubling the rep rate (below ~125GeV/beam)**
  - BDS WG discussed implications with other Working Groups:
    - DR => **OK!** (new conceptual DR design was presented!)
    - Sources => **OK!**
    - Linac, HLRF, Cryogenics => **OK!** (more stud/R&D needed)
    - Beam physics / dynamics -> **OK!** (more study needed)
- **FD optimized for ~250GeV CM**
  - Shorter FD reduce beam size in FD and increase collimation depth, reducing collimation related beam degradation
  - Will consider exchanging FD for low E operation or a more universal FD that can be retuned

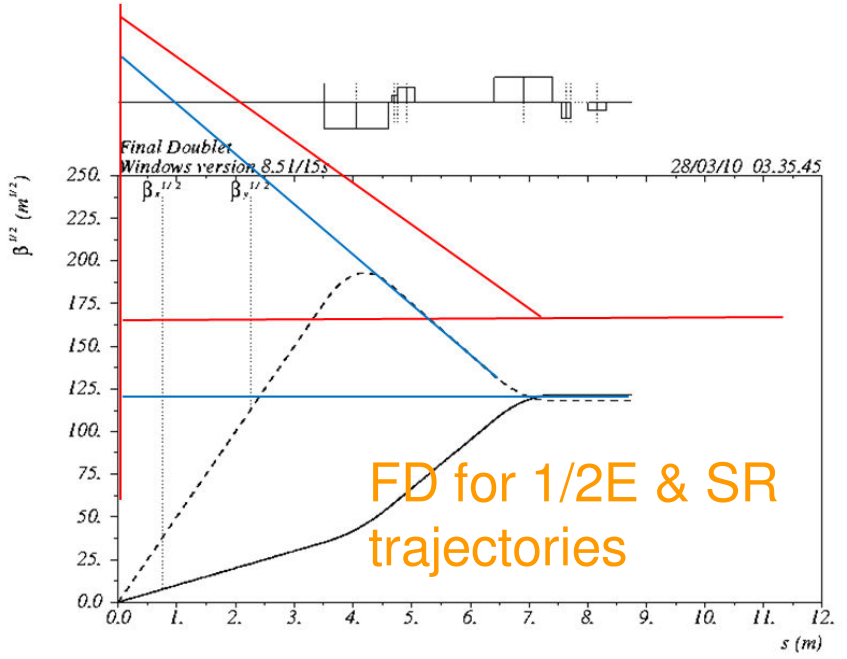
FD for low E

FD optimized for lower energy will allow increasing the collimation depth by ~10% in Y and by ~30% in X (Very tentative!)

- One option would be to have a separate FD optimized for lower E, and then exchange it before going to nominal E
- Other option to be studied is to build a universal FD, that can be reconfigured for lower E configuration (may require splitting QD0 coil and placing sextupoles in the middle)





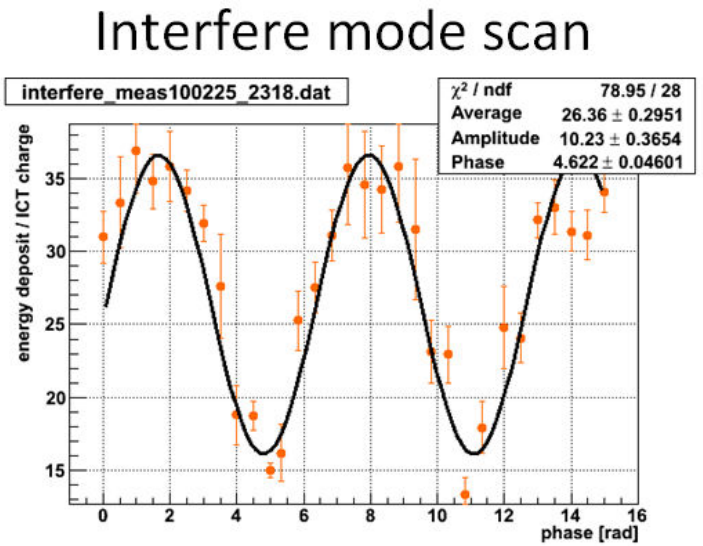


Ongoing R&Ds at ATF/ATF2

- **ATF**
- **low emittance beam**
  - Tuning, XSR, SR, Laser wire,…
- **1pm emittance** (DR BPM upgrade,.
- **Multi-bunch**
  - Instability (Fast Ion,…)

Extraction by Fast Kicker

Others
- Cavity Compton
- SR monitor at EXT



- **ATF2**
- **35 nm beam size**
  - Beam tuning (Optics modeling, Optics test, debugging soft&hard tools,…)
  - Cavity BPM (C&S-band, IP-BPM)
  - Beam-tilt monitor
  - IP-BSM (Shintake monitor)
- **Beam position stabilization (2nm)**
  - Intra-train feedback (FONT)
  - feed-forward DR->ATF2

Others
- Pulsed 1um Laser Wire
- Cold BPM
- Liquid Pb target
- **Permanent FD Q**
- **SC Final doublet Q/Sx**

Sources: Issues related to SB2009

Positron source (undulator end of linac):

1) Ecm > 300 GeV: We have enough margin for the e+ yield.

2) Low energy luminosity:

10 Hz operation will recover luminosity at Ecm = 250 GeV.

10 Hz operation will work at some level at Ecm > 230 GeV.

However at Ecm=200 GeV, luminosity is close to zero.

3) Radiation issues:

10 Hz operation may give more radiations. Homework for WG1.

4) Upgradability to 60% polarization up to Ecm = 500 GeV:

There is concern about collimator (γ rays goes narrow divergence). Homework for WG1.

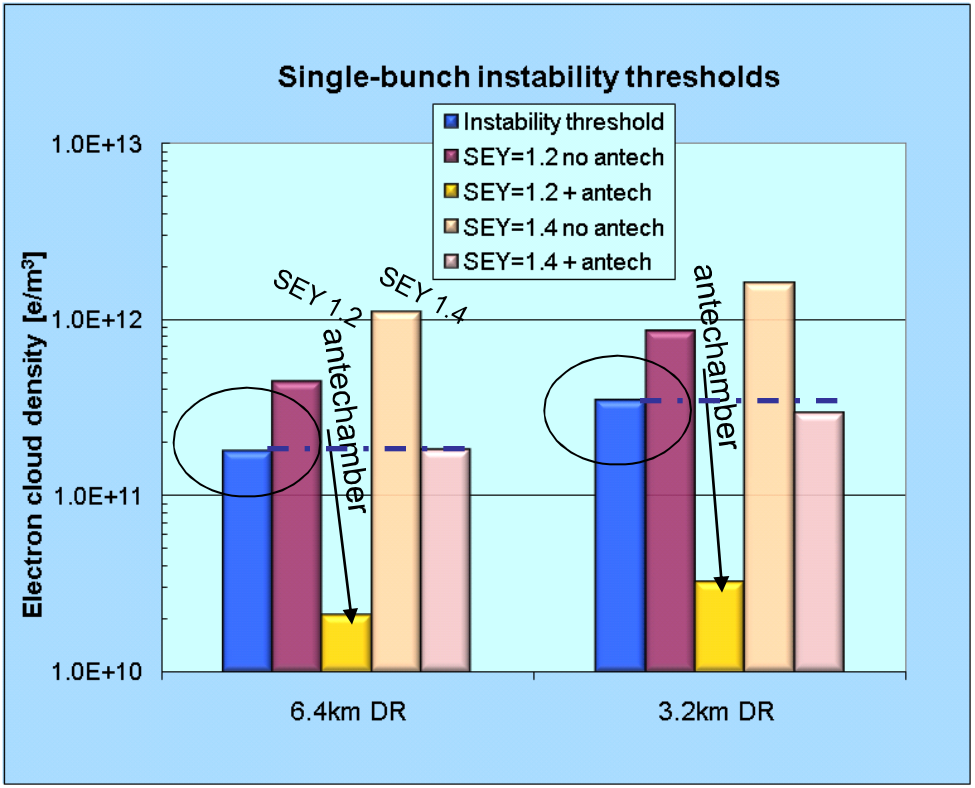
5) Upgradability to Ecm = 1 TeV:

There are concerns about target and collimator (γ rays goes narrow divergence). Homework for WG1.

Electron source: no specific issues

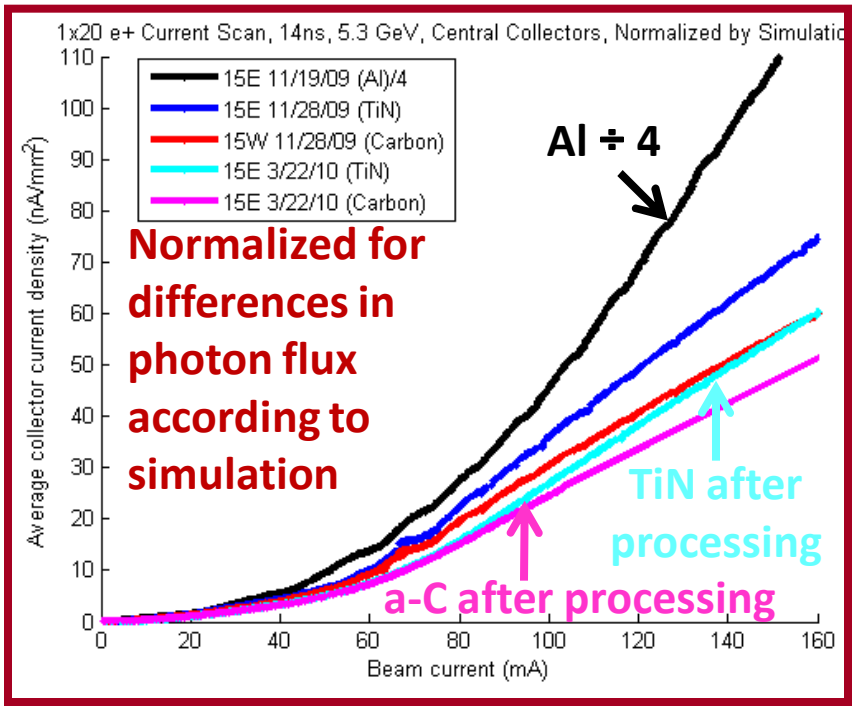
Damping Rings Highlights

- 6.4 km vs 3.2 km Rings



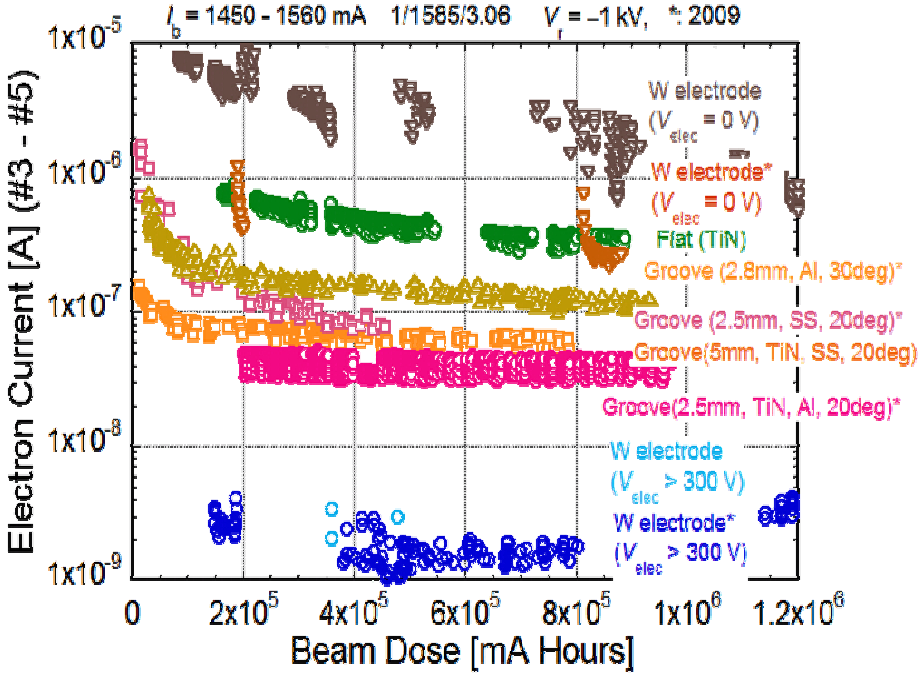
  - **3.2km ring with low power option (1300 bunches) is a low risk option**

- EC Mitigations
  - **Grooves are effective in dipole fields, but challenging to make when depth is small**
  - **Amorphous C and TiN coatings show similar levels of EC suppression - both can be considered for DR use**



Damping Rings

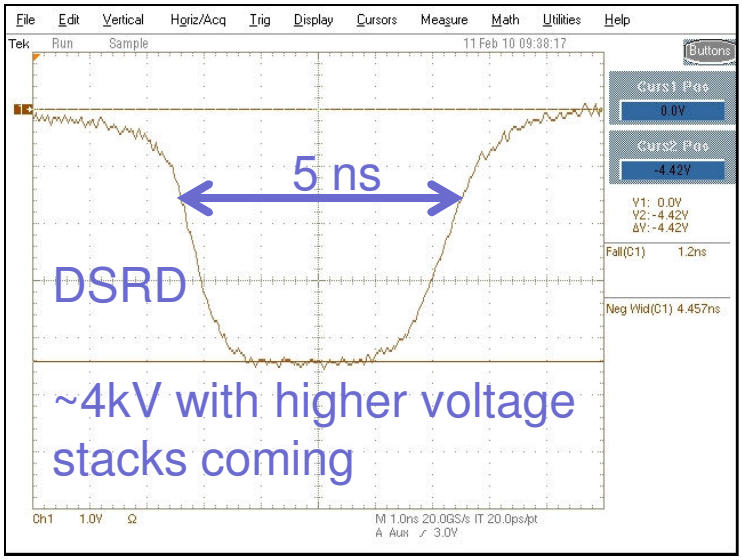
- EC Mitigations (cont'd)
  - Groove and Electrode Comparisons – KEK



  - Further beam tests with clearing electrodes at CESRTA and DAΦNE soon

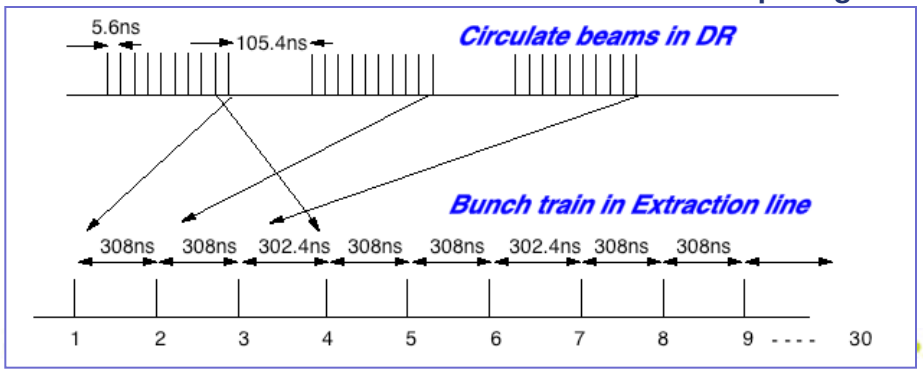
Fast Kickers

SLAC

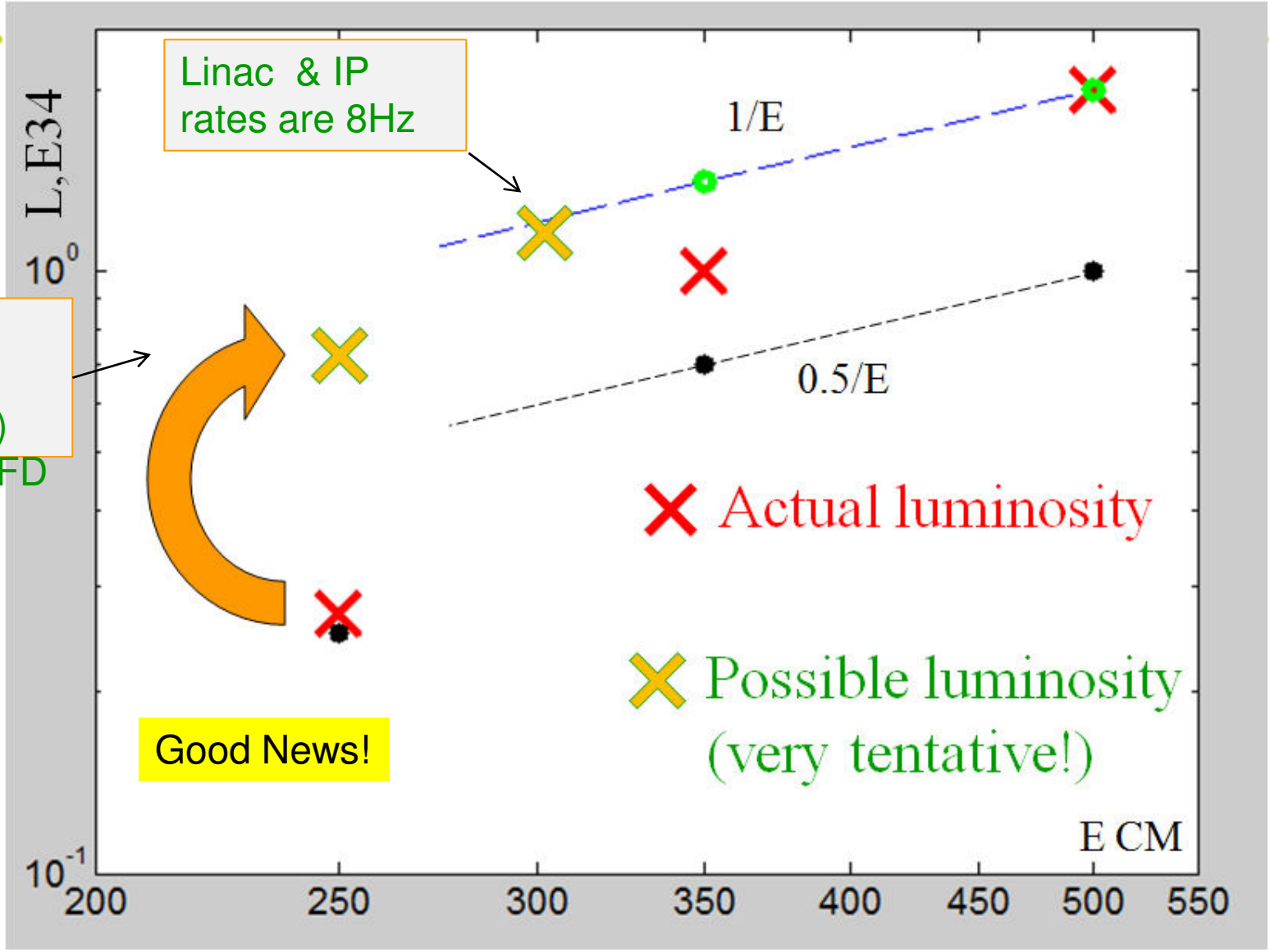


ATF Beam Tests

- **Four 10kV/3Mhz pulsers were used with a bump orbit for the ATF beam extraction.**
- **Kick angle was stable as $4x10^{-4}$ < ILC requirement.**
- **Multi-bunch extraction demonstrated with 308ns spacing**



SB2009 Luminosity: Good News!



Linac rate
10Hz
(IP rate 5Hz)
and special FD

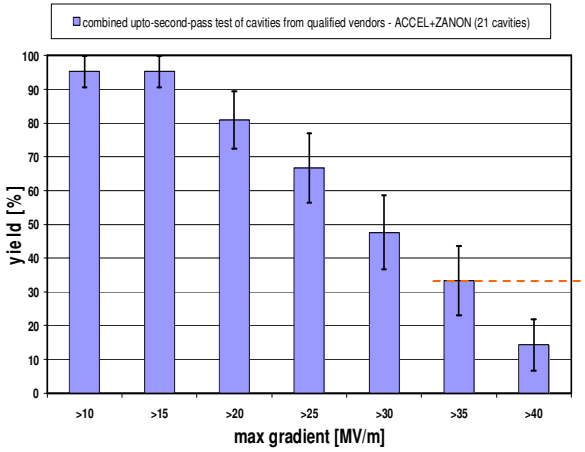
Good News!

Global Plan for SCRF R&D

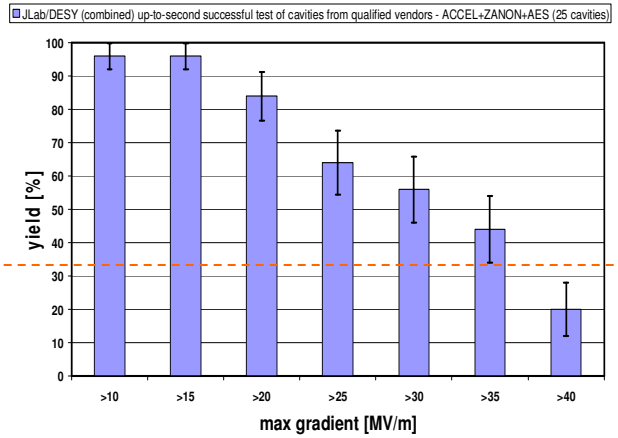
Year	07	2008	2009	2010	2011	2012
Phase	TDP-1			TDP-2		
Cavity Gradient in v. test to reach 35 MV/m	→ Process Yield 50%			→ Production Yield 90%		
Cavity-string to reach 31.5 MV/m, with one-cryomodule		Global effort for string assembly and test (DESY, FNAL, INFN, KEK)				
System Test with beam acceleration			FLASH (DESY) , NML (FNAL) STF2 (KEK, extend beyond 2012)			
Preparation for Industrialization				Production Technology R&D		

Historical Progression of Up-to-second-pass yield w/ qualified vendors

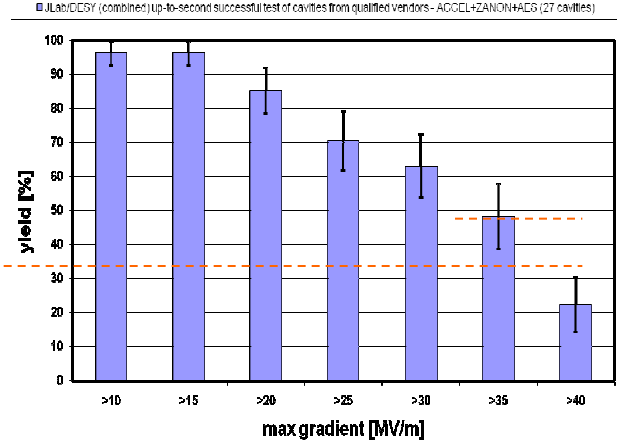
GDE: 1.Oct.2009



AAP: 6-7Jan.2010



ILC-10: 28 March, 2010



Camille Ginsburg & DB Team:

Yield and statistical uncertainties:	>25 MV/m		>35 MV/m	
Reported, March 27, 2010:	1st pass	2nd pass	1st pass	2nd pass
ALCPG-Albuquerque 1.Oct.2009	63+-10	67+-10	23+-9	33+-10
AAP-Oxford 6.Jan.2010	63+-9	64+-10	27+-8	44+-10
ILC-10-Beijing 28.Mar.2010	66+-8	70+-9	28+-8	48+-10

What we need to study in TDP-2

- Balance between R&D target values and Operational parameters
Will be reviewed after S1 experience
-System design should require reasonable margin for the individual component and the system operation

S1 (~ Component performance) > ILC-Acc. Operational Gradient

	RDR/SB2009	Re-optimization required with cautious, systematic design	
R&D goal: S0	35 (> 90%)	35 MV/m (> 90 %) *Keep it, and forward looking*	
S1 (w/o beam)	31.5 in av.	*need: >* 31.5 in av., to be further optimized	31.5 in av.
S2 (w/ beam acc.)	31.5 in av.	> 31.5 in av.	31.5 in av.
ILC: operational gradient	31.5 in av.	31.5 in av. (+/- 10 ~ 20 %)	*or: <* 31.5 in av,, to be further optimized

S1 Goal: Achieved at DESY/XFEL

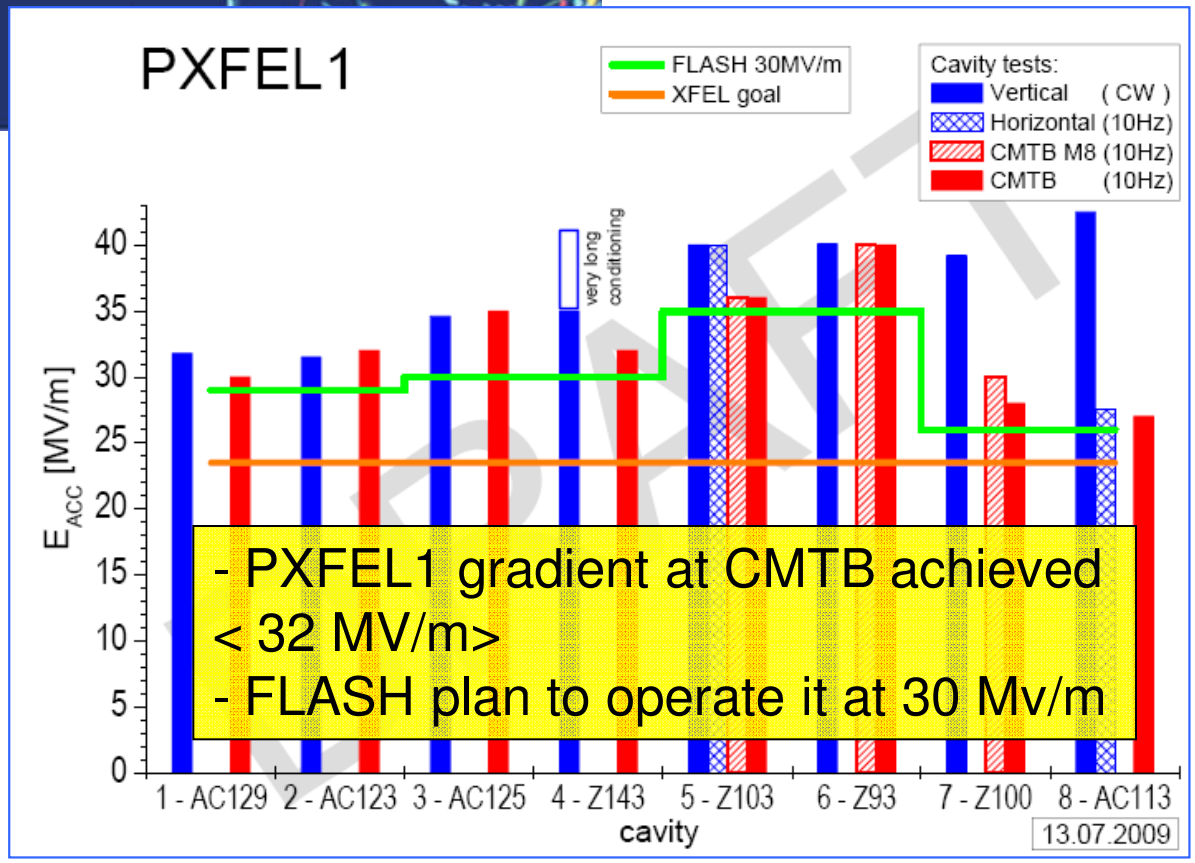
NewsLine

Around the World

Cryomodule surpasses ILC gradient test

European-XFEL cryomodule using SCRF technology sets new record

The cryomodule that set the world gradient record in the testbench at DESY



First XFEL prototype module **exceeds 31.5 MV/m average**
- Module will see beam in FLASH in 2010 (av. of 30MV/m)
- Cryostat (cryomodule cold-mass) contributed by IHEP, in cooperation with INFN

A Proposal for Cavity Gradient

- **Appropriate balance should be re-considered b/w**
  - R&D stage and Project stage
  - Components and Accelerator System Operation

- **A new guideline toward TDP-2 and TDR**
  - R&D Goal for Cavity Gradient (unchanged) : 35 MV/m (@ 90 % yield)
  - Guideline for System Engineering to be updated:

  - G_{Cavity} > $G_{Cryomodule}$ > $G_{ILC\text{-}operation}$
  - <35 MV/m> : <33 MV/m> : <31.5 MV/m>

- **Our homework**
  - How much gradient spread to be allowed?
    - To be optimized within 10 – 20 % in balance of RF distribution efficiency
  - Can we justfy the above operational margins?
    - ~ 5 % in Cavity (itself) operational margin in cryomodule operation
      - To prevent excessive field/field-emission/cryogenics-load and quench
    - ~ 5 % in LLRF/HLRF and beam tune-ability and operational margin or overhead
      - We shall learn FLASH/NML/STF progress in TDP-2

SCRF: What to be reviewed?

- **Fundamental Research to improve 'Gradient'**
  - R&D status and understanding of limit
  - Strategy for improvement
- **Preparation for 'Industrialization'**
  - Cost effective production and quality control
    - 90 % (9-cell cavity) corresponding to ~ 99 % (1-cell cavity)
  - Balance between R&D and ILC operation parameters with beam,
- **System Design and Engineering**
  - Integration (compatibility, alignment, accuracy)
  - Optimization with other components,
    - CFS, HLRF/LLRF, Beam handling, and others,
    - Best Operation Gradient to be determined

SCRF: Status and Proposal

- **In SB2009, ILC operational field gradient left unchanged**
  - CF&S study enables to stay at 31 km in ML tunnel length
- **R&D Goal for SCRF cavity gradient**
  - Keep: 35 MV/m (at Q0 = 8E9) with the production yield of 90 %,
  - Allow: Spread of cavity gradient effective to be taken into account
    - to seek for the best cost effective cavity production and use,
- **System Design to establish ILC operational gradient**
  - Necessary adequate balance/redundancy between the 'R&D gradient-milestone' and the 'ILC operational gradient

    - G_{Cavity} > $G_{Cryomodule}$ > $G_{ILC\text{-}operation}$
    - <35 MV/m> : <33 MV/m> : <31.5 MV/m>
- **Industrialization to be prepared**
  - Lab's collaboration and effort with regional varieties/features,
  - Industrialization model to be discussed and studied
    - A satellite meeting for the 'ILC cavity Industrialization at IPAC, May 23, 2010.

A Satellite Workshop at IPAC-2010

Industrialization of SCRF Cavities

Date : Sunday May 23, 2010 **prior to IPAC-2010**

Place: Kyoto International **Conference** Center

Organized by: ILC-GDE Project Managers

Objectives and Plan:

- To discuss and exchange information on status and preparations for the 'ILC SCRF Cavity' industrialization between industries and laboratories,
- Current regional industrialization efforts will be reported by laboratory representatives; reports on industrial studies and relevant industrial experience will be presented.

Second Announcement sent/made to major cavity vendors, laboratories and other related industry groups

S1-Global Work Progressing well

E. Kako

Many Thanks!

Cavity String Assembly Team

17th, January 2010'

Patrick Schilling (DESY)

Marco Battistoni (FNAL) Brian Smith (FNAL)

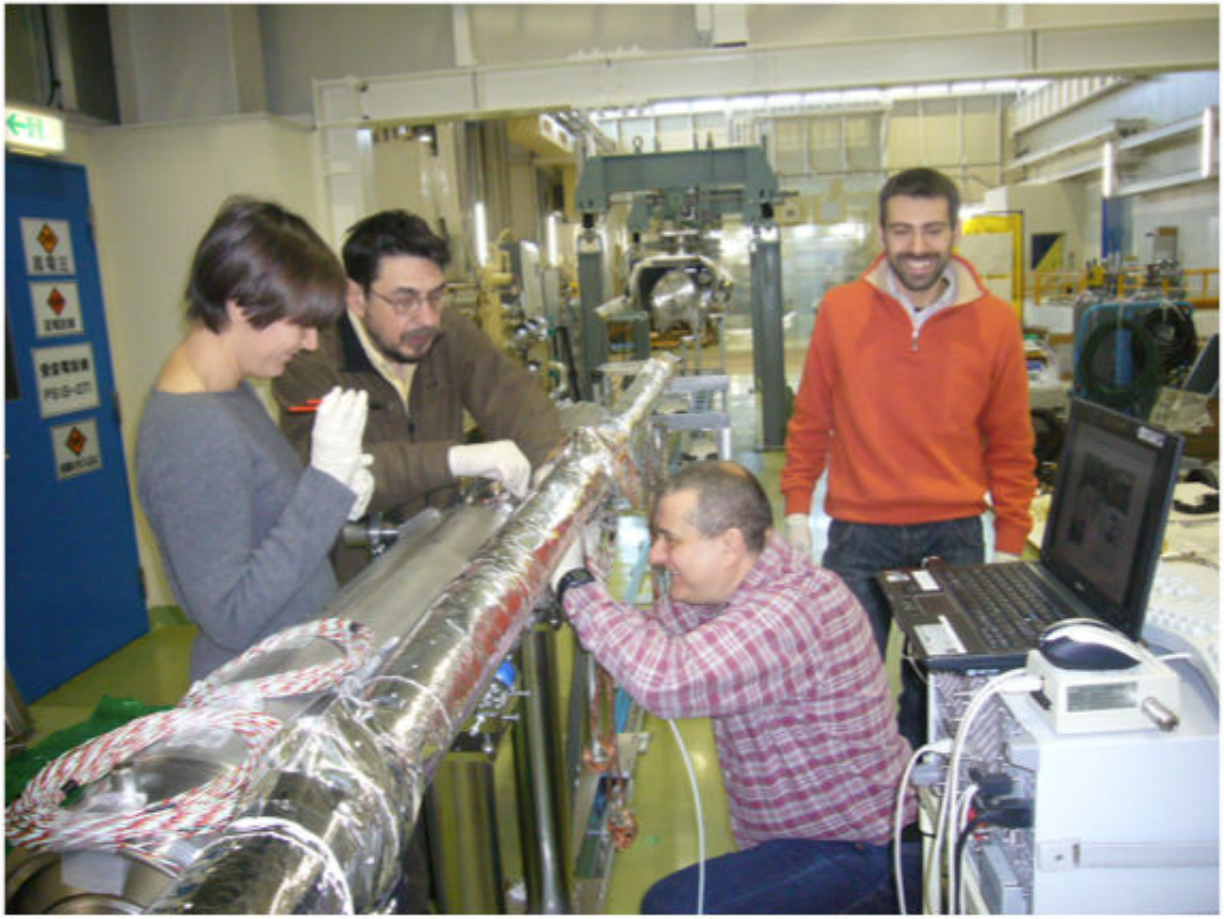
Shuichi Noguchi (KEK) Tug Arkan (FNAL)

Manuela Schmoekel (DESY) Eiji Kako (KEK)

E. Kako

Tuner Assembly Team for S1-Global

2010'
08th , Feb



Carlo Pagani (INFN)

Rocco Pararella (INFN)

Serena Barbanotti (FNAL)

Angelo Bosotti (INFN)

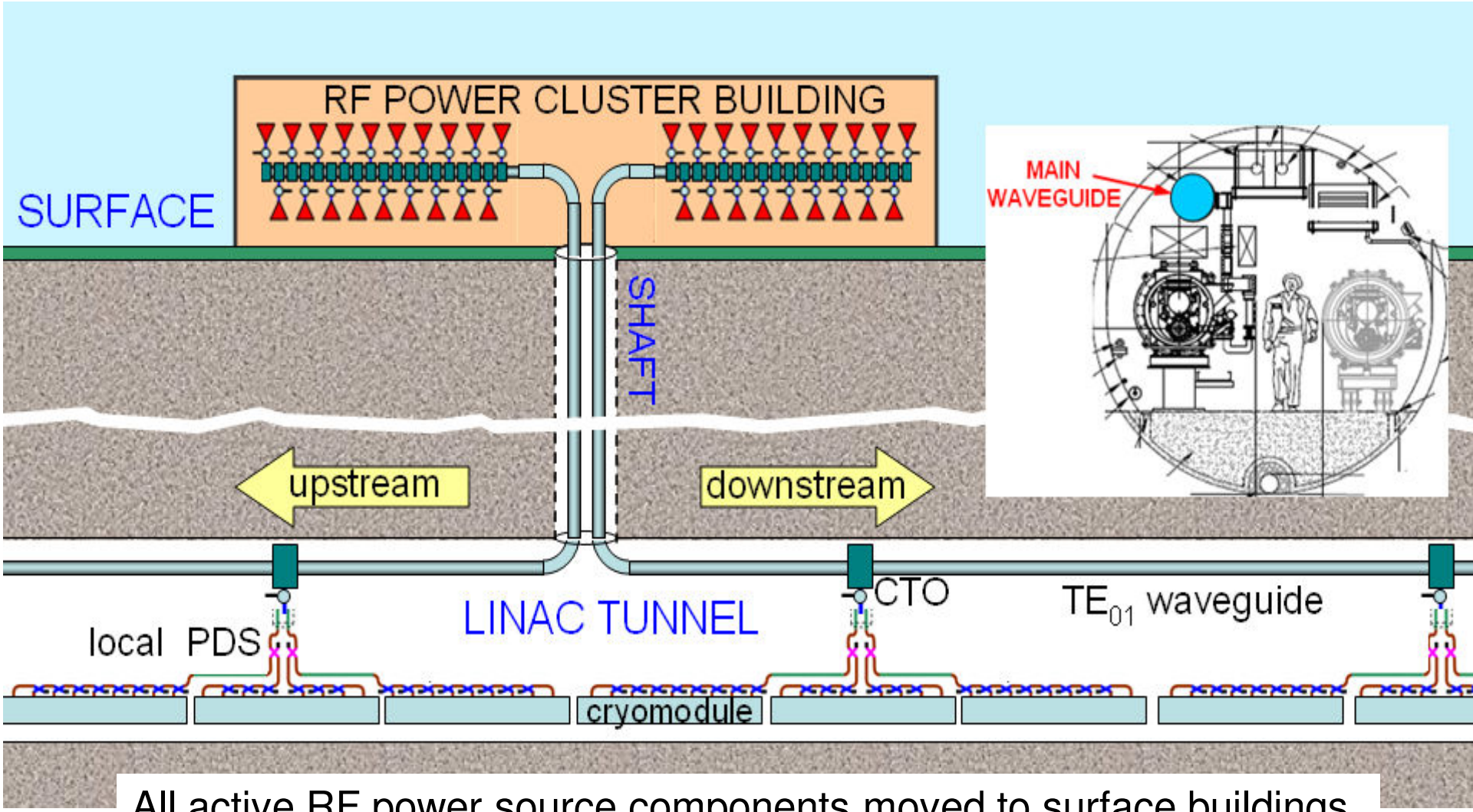
TTF-III Warm Coupler Assembly

E. Kako

March 19th , 2010’

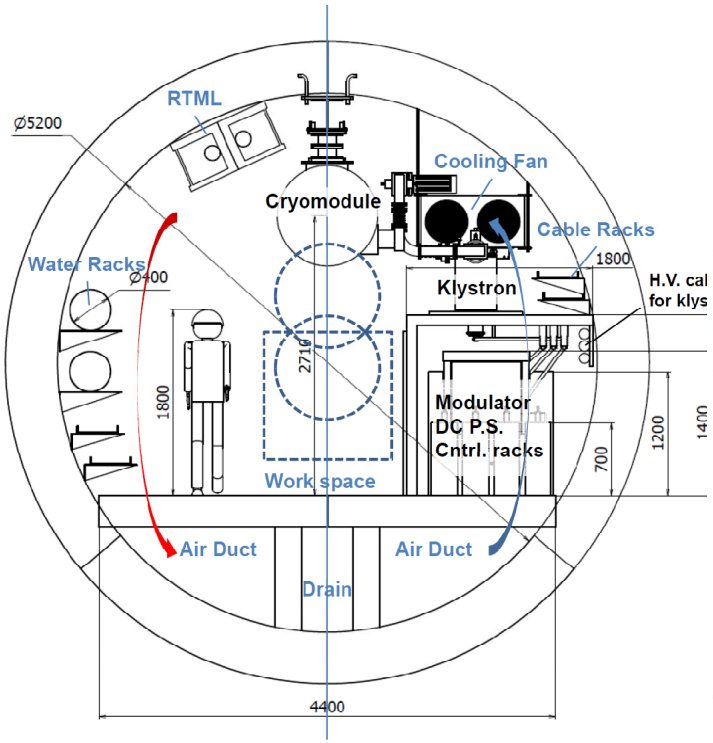
Denis Kostin (DESY)

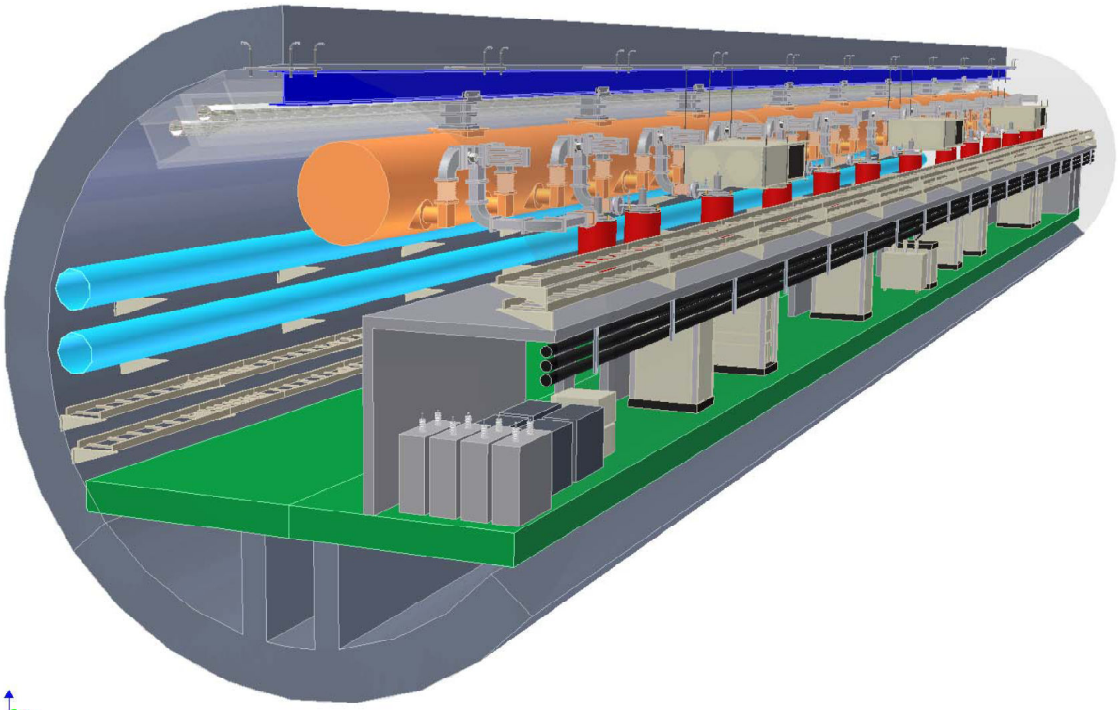
CFS: Klystron Cluster Scheme



All active RF power source components moved to surface buildings

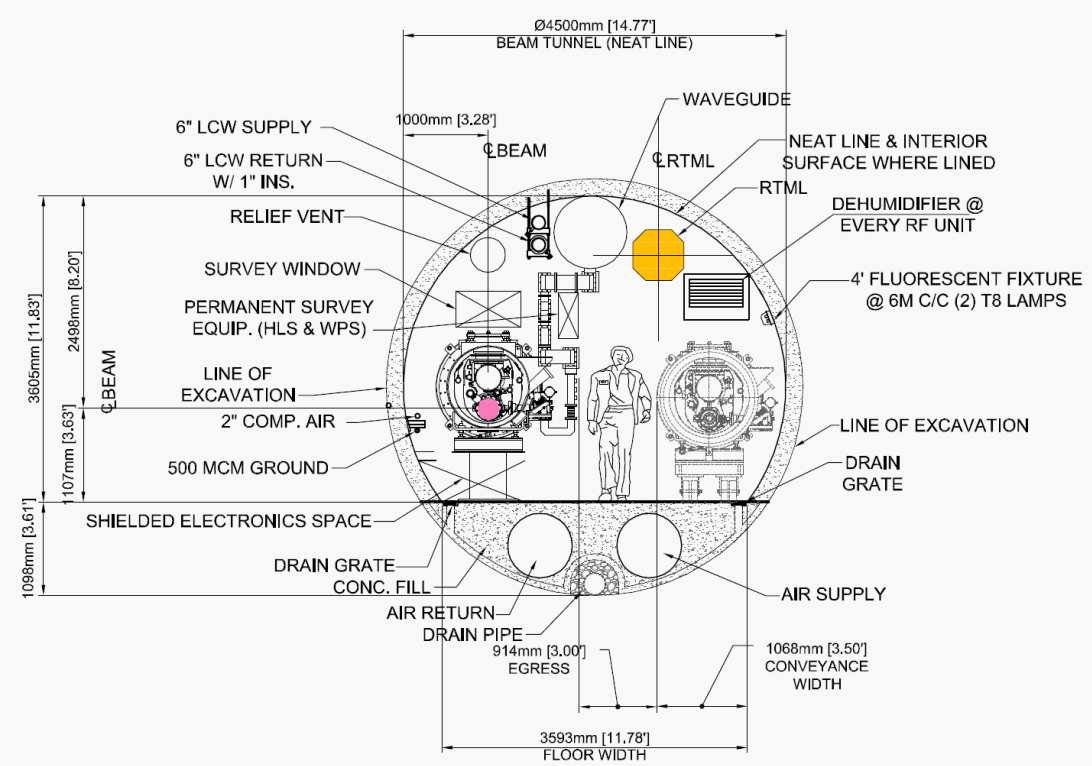
Distributed RF Source

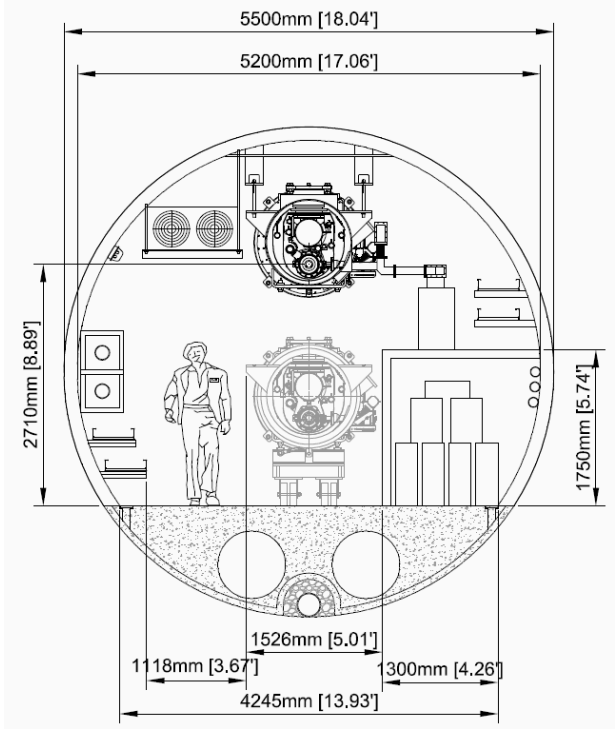




All RF power source components in single tunnel

Americas Region KCS and DRFS

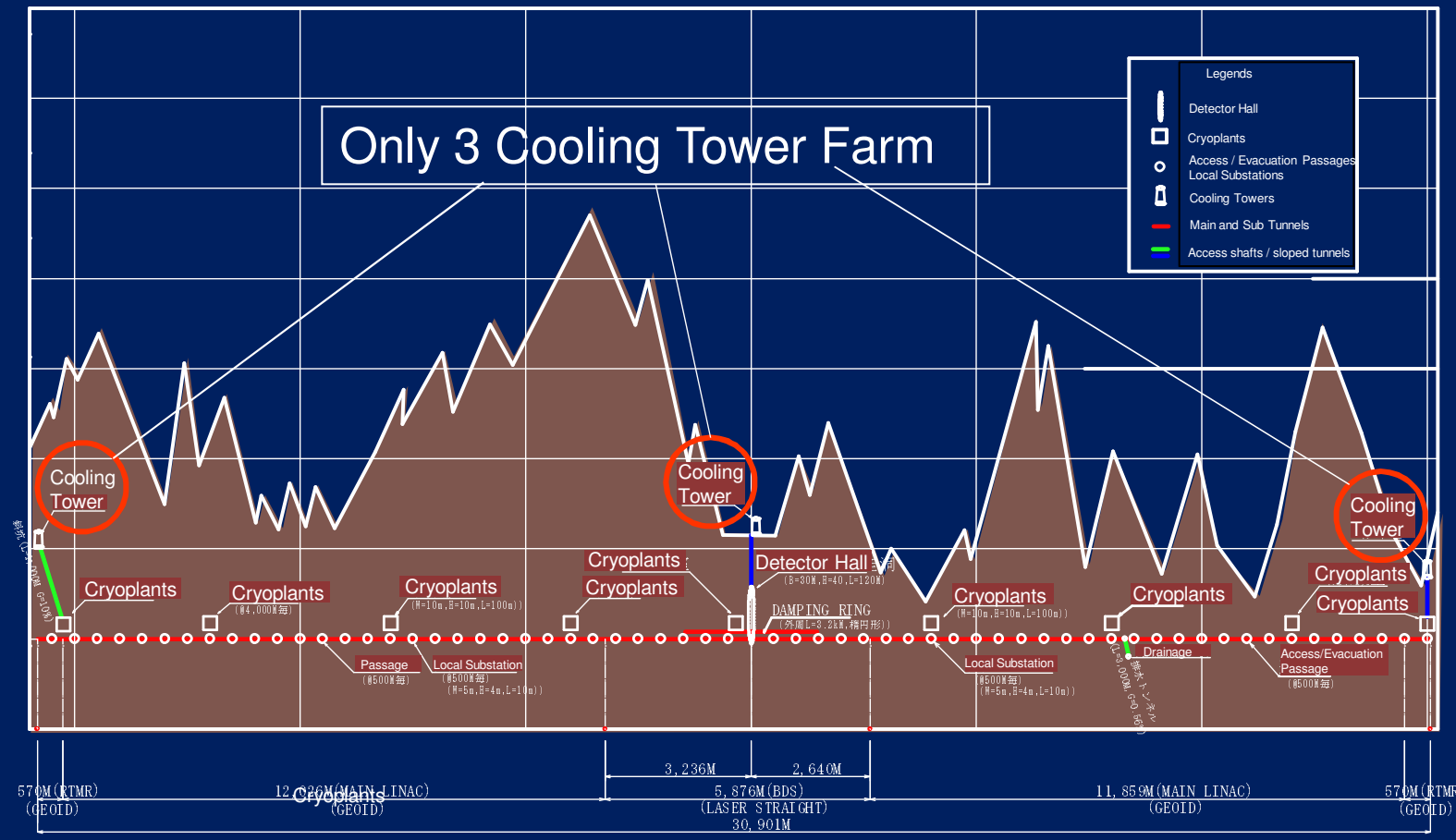




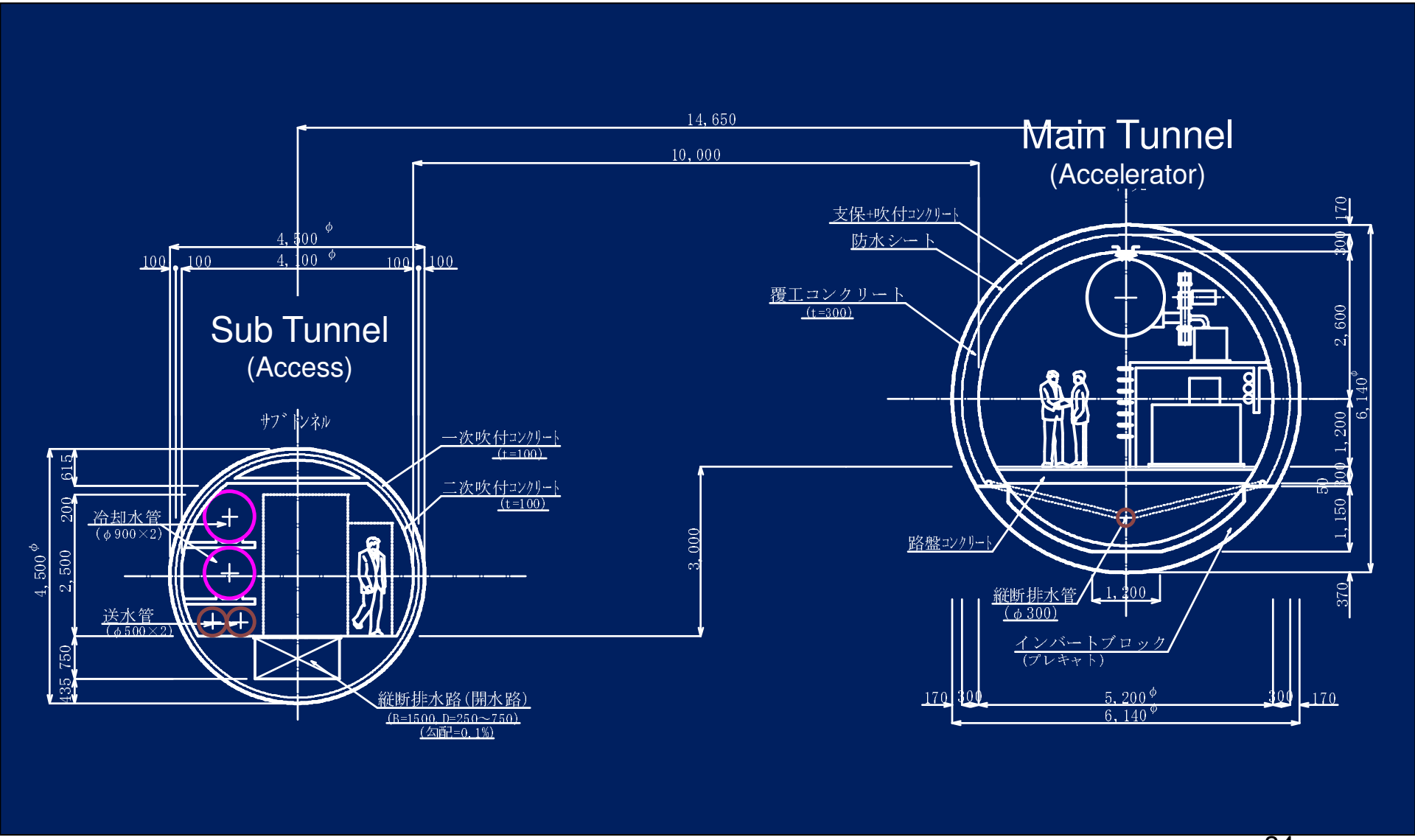
Americas Region KCS 4.5 m Dia.

Americas Region DRFS 5.2 m Dia.

Conceptual Civil Engineering Study in Mountain Region

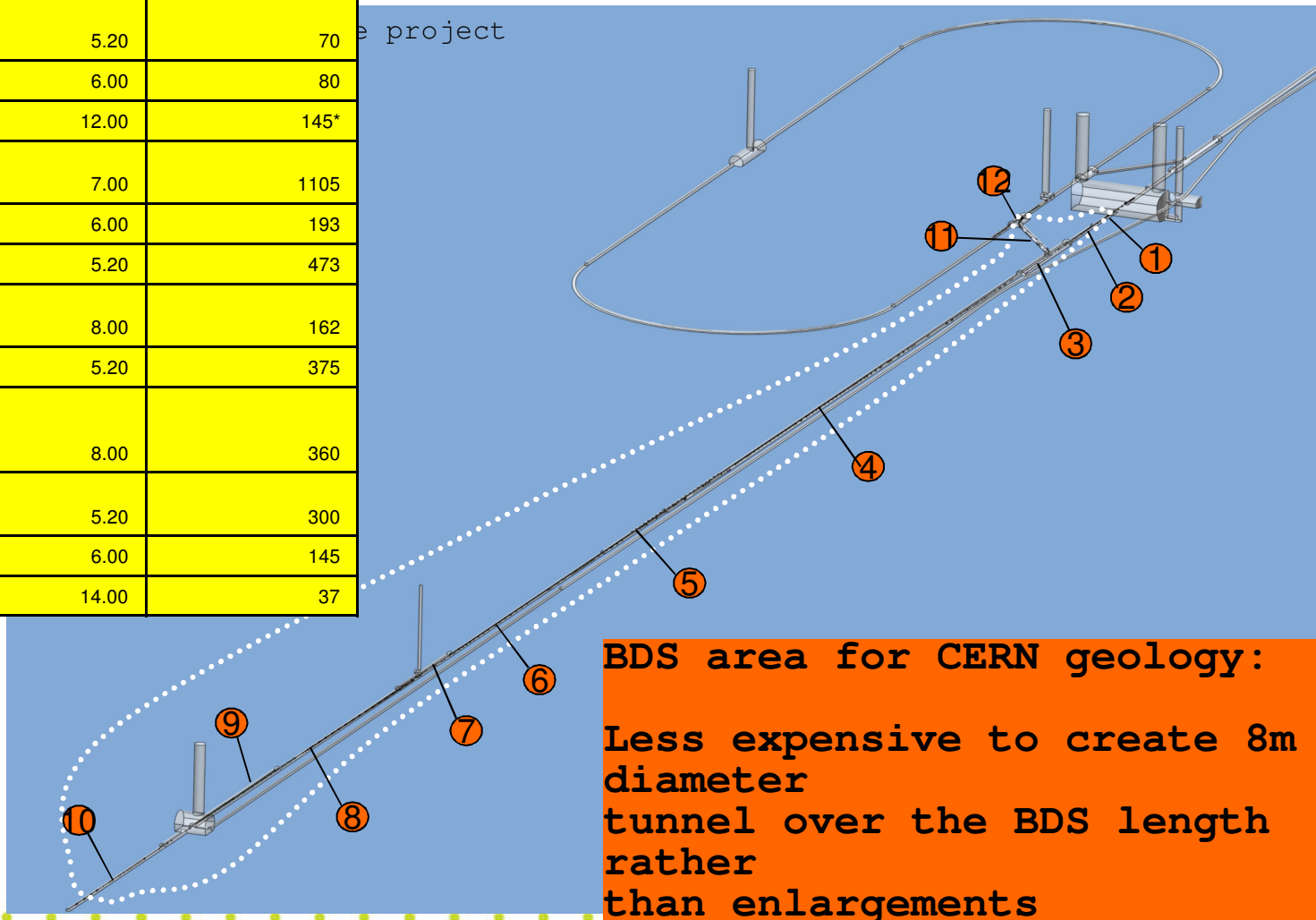


Single Accelerator Main Tunnel
with Access Subtunnel



CFS Study: BDS Area for CERN Gelology

	Diameter (m)	Length (m)
Experimental Cavern Interface **Tunnel 1**	5.20	70
Main Dump Branch **Tunnel 2**	6.00	80
Damping Ring Branch **Tunnel 3**	12.00	145*
PTRAN & BDS Diag. Dump **Tunnel 4**	7.00	1105
BDS Diag. Dump Branch **Tunnel 5**	6.00	193
400 MeV accelerator **Tunnel 6**	5.20	473
Positron Production Tunnel & Remote Handling **Cavern 7**	8.00	162
e- BDS Dogleg **Tunnel 8**	5.20	375
Undulator & Fast Abort Dump Tunnel & Undulator Access **Cavern 9**	8.00	360
End ML – Start Positron **Tunnel 10**	5.20	300
Damping Ring Transfer **Tunnel 11**	6.00	145
Damping Ring Junction **Cavern 12**	14.00	37



BDS area for CERN geology:

Less expensive to create 8m diameter tunnel over the BDS length rather than enlargements

Outline

- **What to have been worked in ILC10?**
  - Key themes in SB2009, and
  - Communication with Physics/Detector Groups
- **Where we have reached?**
  - Cavity Gradient, Single Tunnel,
  - Low Power Parameters, e+ Source location
    - A solution to keep a higher luminosity
- **What we plan, further?**
  - Process for Consensus with Phycis/Detector,
  - Proposal for Top Level Change Control
- **Summary**

Four Themes for TLCC

1. **Average accelerating gradient**

2. **Single tunnel for Main Linac**
   - including HLRF solutions

3. **Reduced RF power parameter set**
   - Including damping rings

4. **Positron source location**

Potential impact on physics scope

Top-Level Change Control (TLCC)

- **Process by which specific themes from SB2009 will be developed and refined**
  - Extension of established AD&I process
- **Formal acceptance as part of TD Phase 2 baseline**
- **Open and transparent process**

Goals of TLCC

- **Technical**
  - Assessment of (technical) implications
  - Impact across system interfaces
  - Cost (& schedule) impact
  - …
- **Stakeholder sign-off**
  - GDE
  - Physics & Detector community (our customers)
  - ILCSC
  - FALC

keyword: consensus

TLCC Process

Issue Identification

- Planning
- Identify further studies
- Canvas input from stakeholders
- …

Baseline Assessment Workshops

- Face to face meetings
- Open to all stakeholders
- Plenary

Formal Director Approval

- Change evaluation panel
- Chaired by Director

keywords: open, transparent

TLCC Process

Issue Identification

- Planning
- Identify further studies
- Canvas input from stakeholders
- …

- **This Workshop**
- **Builds on and extends work done during 2009 ADI process**
- **Generate plans/studies to be done in preparation for the BAWs**

TLCC Process

Baseline Assessment Workshops

- Face to face meetings
- Open to all stakeholders
- Plenary

- **Open plenary meeting**
- **Two-days per theme**
- **Two themes per workshop**
  - Two four-day workshops
- **Participation (mandatory)**
  - PM (chair)
  - ADI team / TAG leaders
    - Agenda organised by relevant TAG leaders
  - Physics & Detector Representatives
  - External experts
- **Achieve primary TLCC goals**
  - In an open discussion environment
- **Prepare recommendation**

TLCC Process

Beamline Assessment Workshops

- Face to face meetings
- Open to all stakeholders
- Plenary

Physics and detector input / representation mandatory

	When	Where	What
WAB 1	Sept. 2010	KEK	1. Accelerating Gradient 2. Single Tunnel (HLRF)
WAB 2	TBD	TBD	3. Reduced RF power 4. e+ source location

TLCC Process

Formal Director Approval

- Change evaluation panel
- Chaired by Director

- **Final formal step**
- **Change Evaluation Panel**
  - Chaired by director
  - Secretary
  - PM(s)
  - Peter Garbincius
  - Ewan Paterson
  - *Other experts TBD*
- **Checks**
  - Proposal for completeness
  - Process was followed
- **Decision by Director**
  - Accepts – becomes baseline
  - Rejects – sent back for further work

Remaining Issues

- **Relationship to R&D**
  - Identifying relevant milestones for TLCC
  - Defining “Acceptance Criteria” (PM responsibility)
  - Remaining R&D beyond TLCC (risk-mitigation)

- **Planning & Logistics**
  - Being open and transparent enough
  - Canvassing (and dealing with) input
    - Beyond physical presence at the BAWs

- **…**

Two Imminent Reports

- **TD Phase Interim Report**
  - To be published: now delayed to end of 2010
  - General status report
  - Terse!
  - Upbeat publication (outreach, communicators)
    - Photos
    - Results
    - ..

Considerable amount of work which will require careful planning.

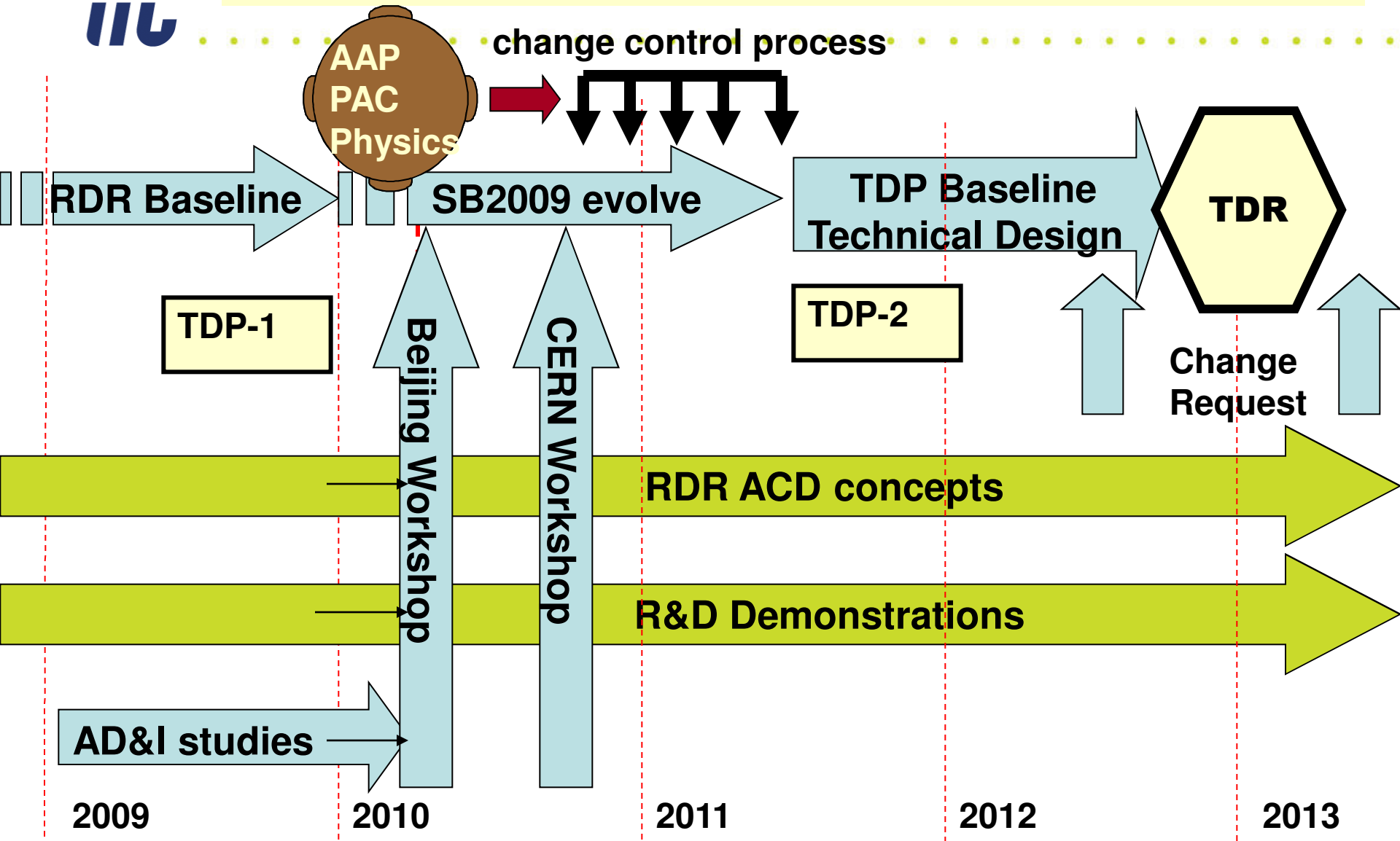
- **TD Phase R&D Plan Release 5**
  - To be published in June 2010
    - Resource tables update in May for FALC RG
  - More detailed planning for TD Phase 2
  - Major update (re-write) expected
    - Main report body – PMs
    - Appendix B sections – TAG leaders

1TeV Upgrade

- **Not much in RDR – more needed for TDR**
  - ILCSC request
- **Commission White Paper on upgrade (2010)**
- **Focus points:**
  - Parameters (incl. upgrade gradient)
  - Construction scenario(s)
  - Cost & Schedule
  - …

Conceptual studies only

Technical Design Phase and Beyond



Summary

- SB2009 discussed
  - in close communication with physics/detector group
- A proposal discussed to improve the luminosity in low energy region
  - Further studies much encouraged to find an optimum condition to be agreed from view points of "physics" and "cost-containment" importance
- Top Level Change Control (TLCC) process
  - Has been established (details to be discussed)
  - Baseline Assessment Workshops (BAW) to be planned
- *We conclude ILC-10: a very productive and forward looking workshop,*
- *Sincere thanks for the ILC-10 Local Organizers.*

Back up

- **Additional slides**

Updated ILC R&D / Design Plan

ILC Research and Development Plan for the Technical Design Phase

Release 4

July 2009

ILC Global Design Effort

Director: Barry Barish

Prepared by the Technical Design Phase Project Management

Project Managers: Marc Ross, Nick Walker, Akira Yamamoto

Major TDP Goals:

- **ILC design evolved for cost / performance optimization**
- **Complete crucial demonstration and risk-mitigating R&D**
- **Updated VALUE estimate and schedule**
- **Project Implementation Plan**

Straw-man Baseline 2009 Working Assumptions (WA)

SB2009 Proposal

1. **A Main Linac length consistent with an *average* accelerating gradient of 31.5 MV/m and maximum operational beam energy of 250 GeV**
   - together with a High-Level RF distribution scheme which optimally supports a spread of individual cavity gradients.

2. **A single-tunnel solution for the Main Linacs and RTML, with two possible variants for the High-Level RF (HLRF):**
   - Klystron cluster scheme (KCS);
   - Distributed RF Source scheme (DRFS).

SB2009 Proposal

3. **Undulator-based positron source located at the end of the electron Main Linac (250 GeV), in conjunction with a Quarter-wave transformer as capture device.**

4. **A lower beam-power parameter set with the number of bunches per pulse reduced by a factor of two (n_b = 1312), as compared to the nominal RDR parameter set.**

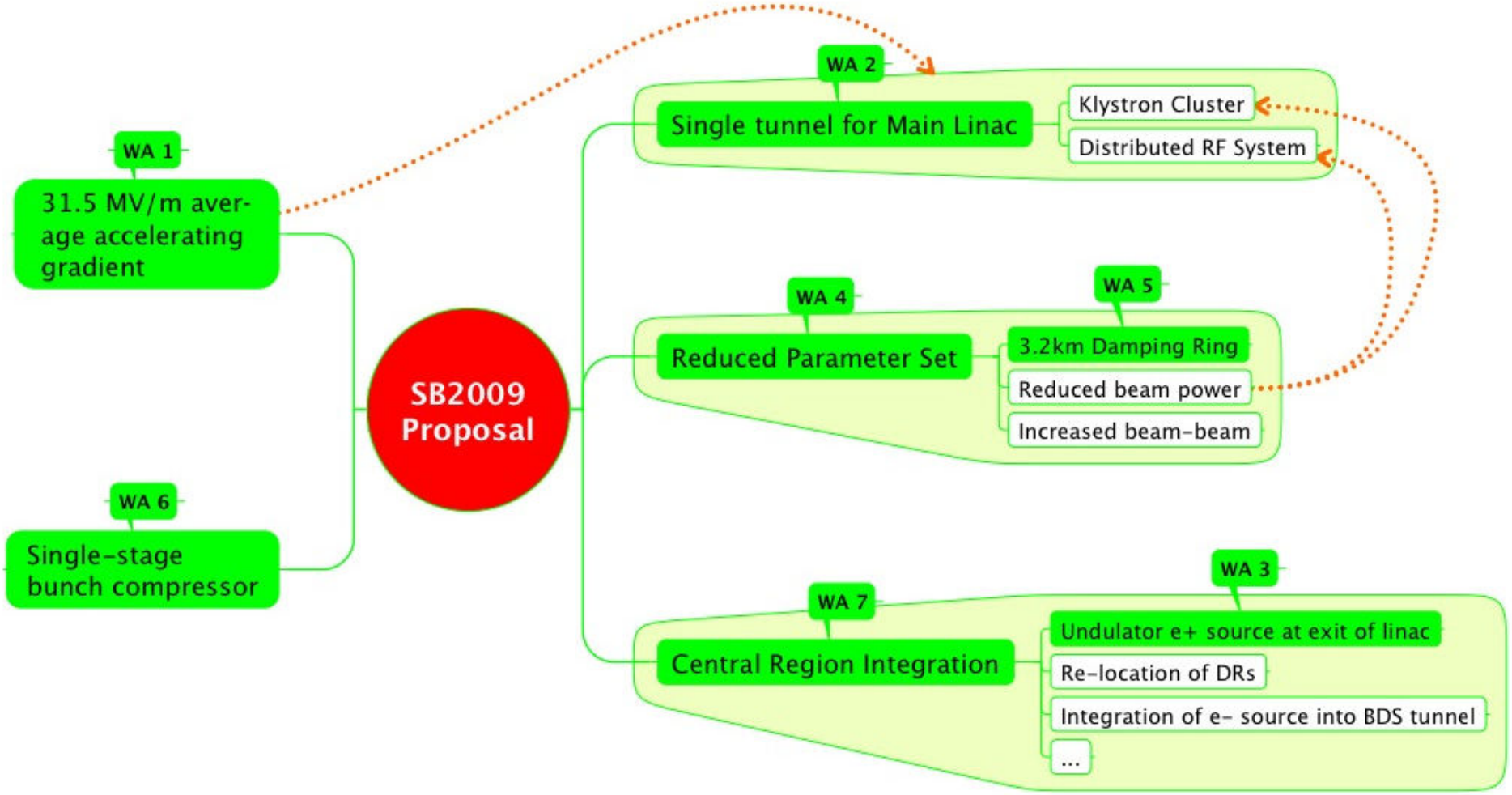
SB2009 Proposal

5. **Reduced circumference Damping Rings (~3.2km) at 5 GeV with a 6 mm bunch length**

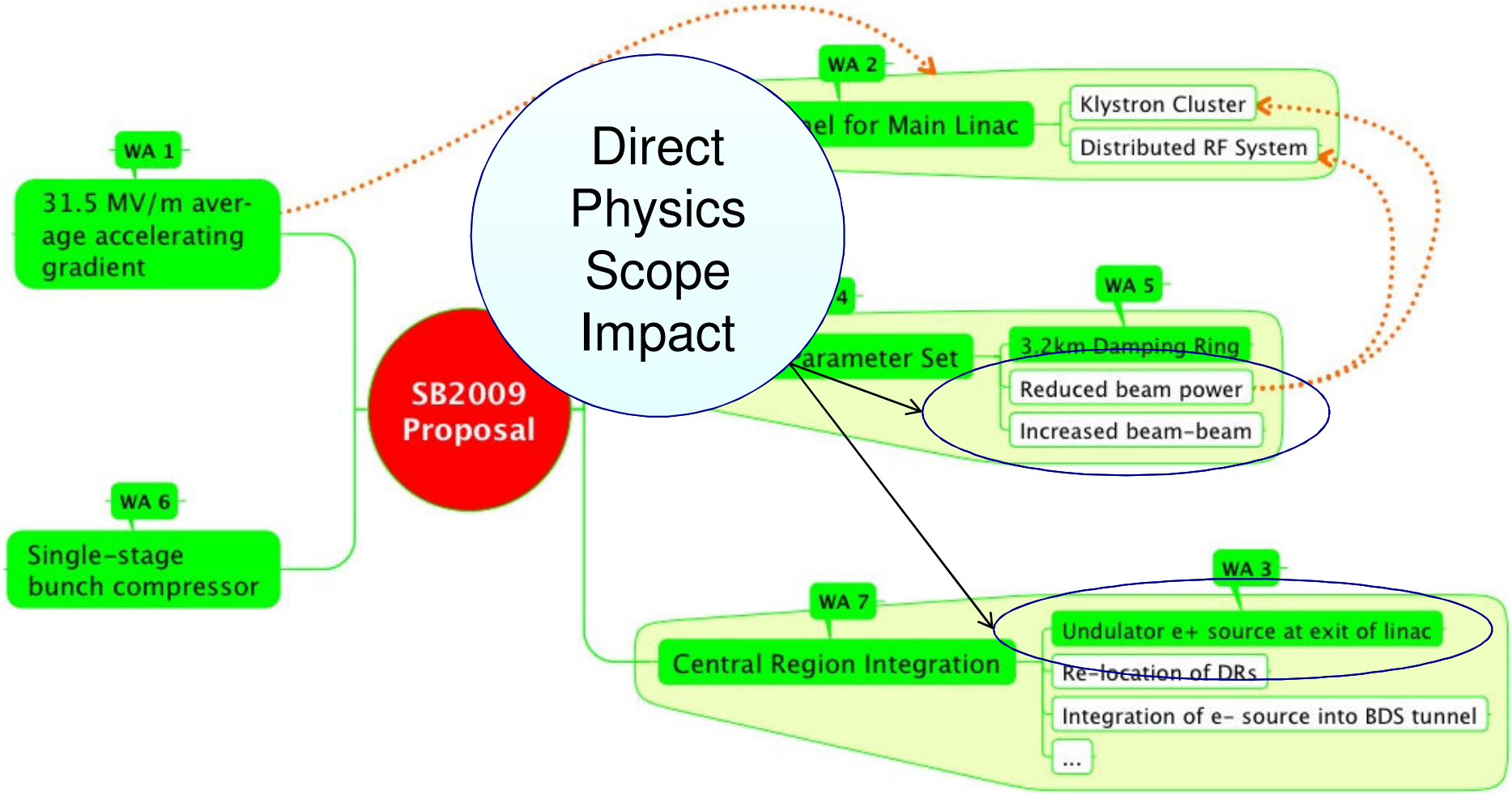
6. **Single-stage bunch compressor with a compression ratio of 20.**

7. **Integration of the positron and electron sources into a common "central region beam tunnel", together with the BDS, resulting in an overall simplification of civil construction in the central region.**

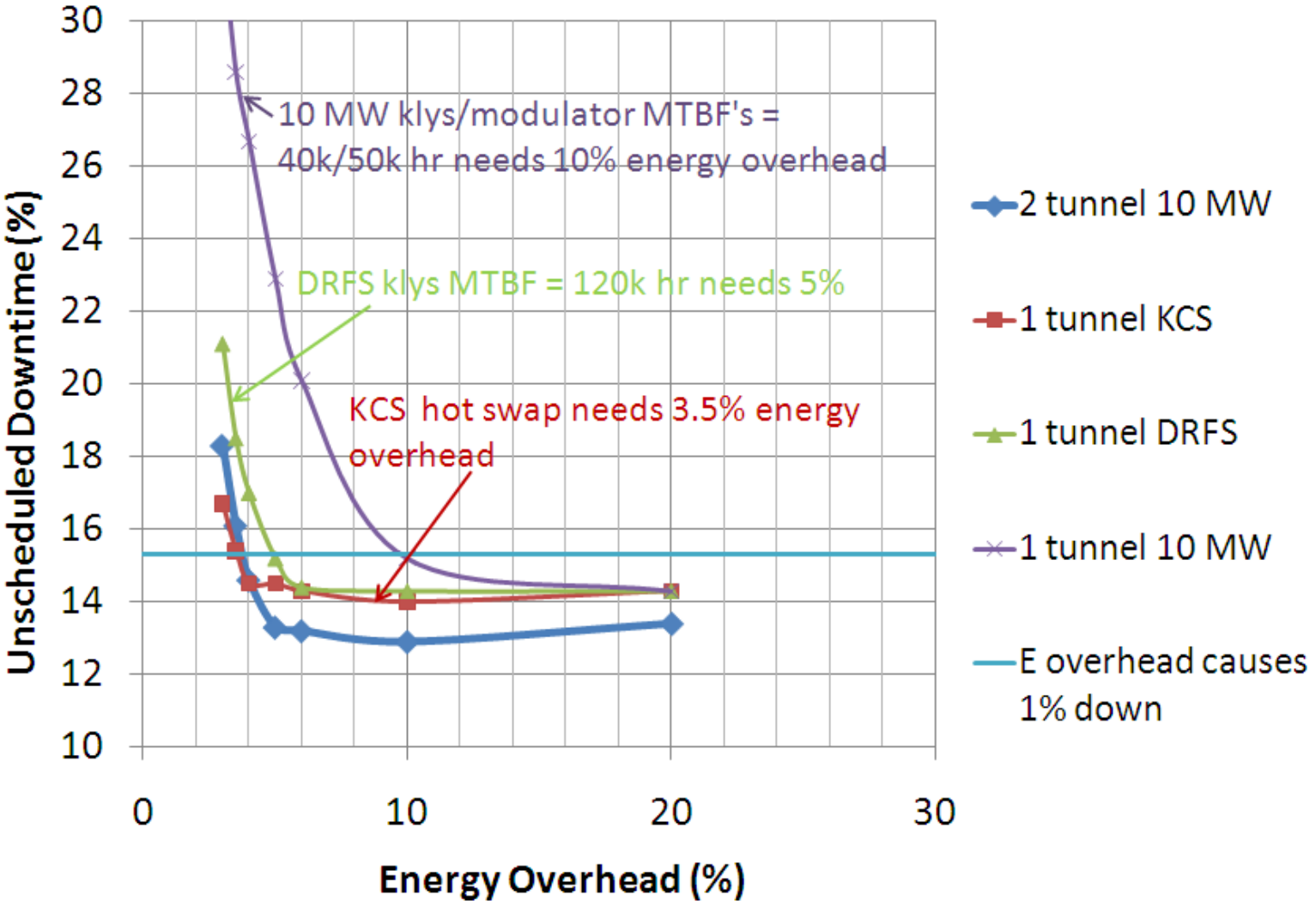
SB2009 Themes



SB2009 Themes



Single Tunnel: Availability



Single Tunnel: Availability

- **Design for High-Availability is important for the ILC**
  - Thousands of components
  - True statement irrespective of two or one tunnel
- **SB2009 focus is on finding acceptable HA solution for the single Main Linac tunnel**
  - Primarily (but not only) driven by HLRF considerations.
- **Availability Task Force established**
  - Monte Carlo simulations using AVAILSIM
  - Maintenance model scenarios
  - Development of HA solutions for HLRF
  - Review of state-of-the-art (MTBF numbers)

Focus of efforts and sessions

- **Work on final focus prototype ATF2**
  - ATF/ATF2 ICB (International Collaboration Board)
  - Progress report, TB (Technical Board) report
  - ICB closed session
    - Joint with DR, Monday 1100-1230
  - ATF2 detailed technical discussions
    - Sun 1400-1530
  - SC FD upgrade design for ATF2
    - Sat 1100-1230

Focus of efforts and sessions

- **Work on design of key technical systems of BDS**
  - Machine detector interface design of Concepts
    - Joint with MDI, Sunday 0900-1030
  - IR stability and vibrations
    - Joint with MDI, Monday 0900-1030
  - SC FD design and prototype progress
    - Saturday 1100-1230
  - MDI diagnostics and backgrounds
    - Joint with MDI, Monday 1400-1530
  - Beam dump design update

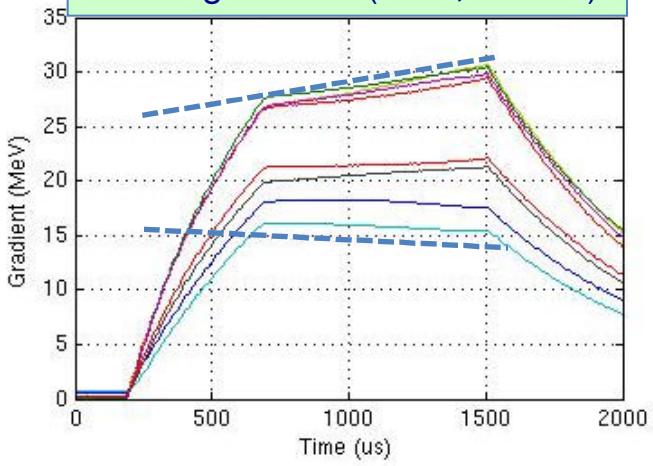
BDS: Focus of efforts and sessions

- **Work on parameter set for a possible new baseline**
  - Joint plenary on parameters & scope
  - SB2009 details and implications on physics (Higgs mass, stau search, etc)
  - Discussion of implication of
    - **Double rep rate (10Hz) at lower energy (e.g. 250GeV CM) for SB2009**
      - Sat 1600-1800 – joint w/ DR and Sources
      - Sun 1700-1800 – joint w/ Linac, HLRF & Cryog. experts

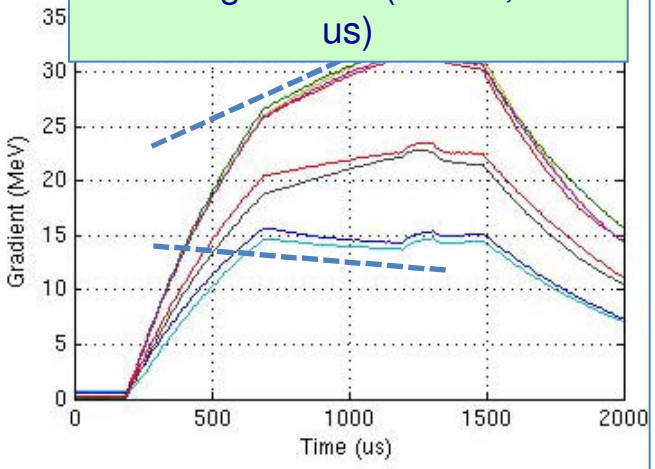
From Nick's talk at FLASH workshop at DESY, on Feb. 22:

Cavity tilts with long bunch trains and heavy beam loading (3mA and 7.5mA, long bunch trains)

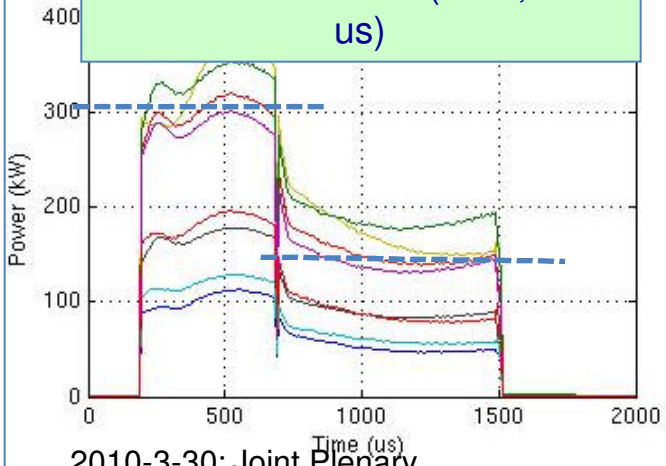
ACC6 gradients (3mA, 800 us)



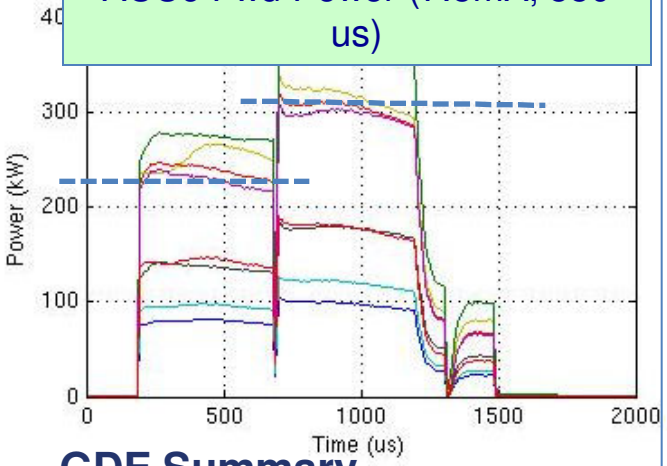
ACC6 gradients (7.5mA, 550 us)



ACC6 Fwd Power (3mA, 800 us)



ACC6 Fwd Power (7.5mA, 550 us)



Gradient tilts are a consequence of using a single RF source to power cavities running at different gradients

At 7.5mA, ACC6 cavities #1 and #2 approached their quench limits at the end of the pulse

The RF power during flat-top is higher than the fill power for the 7.5mA case