



EUROTeV ILPS Work Package Plan 2005-2008

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Abstract

The EUROTeV ILPS work package (WP6) presents the detailed plan and deliverables for the period January 2005-December 2008.

1 Introduction

The EUROTeV Work package 6 (ILPS) consists of seven tasks

- BCDS: design a bunch compressor compatible with multi-TeV centre-of-mass energies.
- PCDL: develop conceptual design of multi-TeV post collision line to ensure upgradability of linear collider.
- BBSIM: verify and improve beam-beam simulation code.
- HTGEN: develop model of halo and tails in linear colliders.
- COLSIM: understand the impact of background on the collimation system design.
- FMSIM: identify key failure modes and evaluate their impact on the machine design
- LAST: develop an alignment and feedback strategy in order to optimise the luminosity performance of the linear collider

An overview of the tasks including the contact people and main objectives is presented in Table 1. Detailed milestones, deliverables and Gantt charts are presented in the following sections.

Name	Contact Persons	Task Reporter	Objectives	Deliverables
BCDS	M. Pedrozzi / PSI	M. Pedrozzi	Design a bunch compressor compatible with multi-TeV centre-of-mass energies Design a path length tuning chicane	Bunch compressor lattice suited for Multi-TeV Tuning chicane lattice Evaluation report of compressor performance
PCDL	V.Ziemann / Uppsala Ph. Bambade / Orsay	V. Ziemann	Develop conceptual design of multi-TeV post collision line to ensure upgradability of linear collider Understand and possibly improve the potential for instrumentation with suitable performance in the post collision line at different energies	Conceptual multi-TeV post collision line design Report evaluating the instrumentation performance in the post collision lines at different energies, for the machine with cms energy up to 1TeV and the multi-TeV case
BBSIM	Ph. Bambade / Orsay D. Schulte / CERN	Ph. Bambade	Verify and improve beam-beam simulation code	Report on benchmarking of GUINEA-PIG New GUINEA-PIG version with spin transport

Name	Contact Persons	Task Reporter	Objectives	Deliverables
HTGEN	H. Burkhardt / CERN	H. Burkhardt	Develop model of halo and tails in linear colliders Identify the potential to verify the model	Estimation of halo population due to different mechanisms Routines to include halo models in collimation simulations Report on potential benchmarks to verify predictions
COLSIM	N. Walker / DESY R. Barlow / UMA G. Blair / RHUL D. Schulte / CERN A. Faus-Golfe / Valencia	G. Blair	Simulation of post-linac beam halo collimation, estimation of collimator efficiency, optimisation of collimation system, simulations of muon and neutron production in collimator sections, estimates of impact of physics detector performance, studies of muon and neutron production, impact of luminosity tuning on halo collimation efficiency.	Simulation code. Collimation system design. Reports of simulation results.
FMSIM	N. Walker / DESY D. Schulte / CERN	N. Walker	Identify key failure modes and evaluate their impact on the machine design	Report on most critical failure modes and their impact on machine performance Code package to simulate most critical failures
LAST	Ph. Burrows / QMUL N. Walker / DESY D. Schulte / CERN	Ph. Burrows	Develop an alignment and feedback strategy in order to optimise the luminosity performance of the linear collider Develop tools to evaluate the luminosity performance of the linear collider due to the effects in the low emittance transport system	Code package to simulate beam transport from damping ring to IP Report describing the alignment and feedback strategy

Table 1 Overview of the ILPS work package.

1.1 Details of the sub-tasks

In the following sections, the individual sub-tasks of WP6 are detailed, with milestones, Gantt charts and deliverables.

2 BCDS - Bunch Compressor Design

Task Manager: M. Pedrozzi (PSI)

2.1 Milestones

- Goal 1. Recruit a post-doc accelerator scientist.
 - Milestones
 - January 05: Advertise post doc. positions at PSI (completed).
 - April 05: Creation of a Web site for the BCDS Task (completed - <http://eurotev.web.psi.ch>)
 - March 05: Post doc Recruited (Frank Schulte, DESY) (completed)
 - July 05: Post doc starting his work at PSI.
- Goal 2. Beam specifications for Multi TeV compressor and path length tuning chicane.
 - Milestones
 - June 05: Produce first set of beam specifications and performance goals for the compressor to be discussed within ILPS.
 - July 05: Produce specifications for path length chicane (compression + phase and energy correction)
 - August 05: Definitive specification and performance goal for simulation work
- Goal 3. Chicane, first order conceptual designs.
 - Milestones
 - December 05: Design with linear chirp and Gaussian electron distributions. Optimization with 1D CSR effects and with respect to ISR.
 - December 05: Benchmark CSR computation with different 1D model.
 - January 06: Chicane after turn around loop design with linear chirp and Gaussian electron distributions. Optimization with 1D CSR effects.
 - January 06: Chicane Benchmark CSR computation with different 1D mode
- Goal 4: Chicane second order conceptual designs.
 - Milestones
 - June 06: Compression chicane optimization with 2D and 3D CSR models.
 - June 06: Path length/compression chicane optimization with 2D and 3D CSR models

2.2 Following activities

- Compression chicane, third order conceptual design
 - Compression chicane optimization using phase space distributions from start to end simulations (exchange between tasks).
 - Path length/compression chicane optimization using phase space distributions from start to end simulations.
- Chicane fourth order conceptual designs
 - Compression chicane lattice design and performance study with respect to dynamic and static imperfections (energy jitter, alignment errors).

- Turn around lattice design.

2.3 Task integration

The task activities should be integrated and considered as an extension of the present effort made for the ILC bunch compressor design, mainly coordinated by SLAC (<http://www-project.slac.stanford.edu/ilc/acceldev/LET/BC/>). The multi-TeV beam parameters specifications upstream and downstream of the chicanes are presently driven by the CLIC requirements. The transport studies from the damping ring to the IP (task LAST) should give a realistic phase space for the ultimate chicane optimisation. The chicane simulation results and in particular the sensitivity to dynamic and static imperfections requires as well a close interaction with the LAST activities.

2.4 Deliverables

The deliverables in Jan 2008 are the following.

1. A conceptual design of a compression chicane suitable for multi-TeV linear colliders with an evaluation of the CSR effects and the compressor performances.
2. A conceptual design of a path length tuning chicane including the CSR effects and the turn around loop lattice.

3 PCDL - Post-Collision Diagnostics Lattice

Task Manager: V. Ziemann (Uppsala)

3.1 Milestones

- Goal 1: Recruitment
 - Milestones
 - March 05: ILC PostDoc recruited (Olivier Dadoun)
 - April 05: Multi-TeV PostDoc recruited (Arnaud Ferrari)
- Goal 2: Software
 - Milestones
 - April 05: made available MAD, DIMAD, GUINEA-PIG
 - April 05: BDSIM operational
 - June 05: Comparison of BDSIM and DIMAD
 - June 05: 3D modeller for beamline
 - August 05: 3D-Fieldmap and direct force equation integrator
 - August 05: Losses calculation program
- Goal 3: ILC studies
 - Milestones
 - March 05: Beamstrahlung photon cone studies and comparison for e and e^-/e^-
 - June 05: Study of the post collision line of the 2mrad crossing angle scheme
 - December 05: Losses in the post collision line
 - December 05: Comparison of e and e^-/e^- collision
 - December 05: Neutron simulation and tracking upgrade in BDSIM

- December 05: Beam parameter optimization for e-e- collision and compatibility of optics e and e-e-. Application to the 2 and 20 mrad extraction lines.
 - December 06: Background simulation studies (photons, electrons, neutrons) created by the beam losses along the extraction line. Studies of the behavior of those particles: probability to hit the detector, post-IP spectrometer or polarimeter. Comparison of the 2mrad and 20mrad.
 - December 06: Datagrid computing application using BDSIM and software adaptation.
 - December 06: Final report for sub-TeV
- Goal 4: Multi-TeV/CLIC studies
 - Milestones
 - September 05: Extrapolating the sub-TeV design to higher luminosities and identification of the problem areas.
 - December 05: Extrapolating the sub-TeV design to higher energies and identification of the problem areas.
 - December 05: Report on short-comings of extrapolated sub-TeV design
 - March 06: Adapted design for multi-TeV
 - June 06: Report on a post-collision design for multi-TeV
 - June 06: Coherent pair diagnostic for luminosity measurements and its implementation
 - September 06: Beamstrahlung diagnostics and implementation
 - September 06: Feasibility of polarization diagnostics in the post-collision line
 - December 06: Report on integration of diagnostics features in the multi-TeV design
 - September 07: Optimization of the multi-TeV design
 - December 07: Final report for multi-TeV

3.2 Gantt Chart

WP6: ILPS/PCDL												
	2005				2006				2007			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Recruitment:												
PostDoc (sub-TeV)	1.1											
Post-Doc (multi-TeV)		1.2										
Software:												
MAD, DIMAD, GUINEA-PIG	2.1											
BDSIM operational		2.2										
Comparison BDSIM and DIMAD		2.3										
3D modeller for beamline		2.4										
3D-Fieldmap and direct integrator			2.5									
Losses calculation program			2.6									

Sub-TeV/ILC studies:																				
Beamstrahlung and comparison e+/e- vs. e-/e-	3.1																			
2 mrad post collision line		3.2																		
Losses in the post collision line		3.3	>>>	>>>																
Comparison e+/e- and e-/e- collisions		3.4	>>>	>>>																
Neutron background simulations		3.5	>>>	>>>																
Optimization and compatibility		3.6	>>>	>>>																
Background studies for 2 and 20 mrad schemes						3.7	>>>	>>>	>>>											
Datagrid application									3.8	>>>	>>>									
Final report												3.9								
Multi-TeV/CLIC studies:																				
Extrapolating luminosities of sub-TeV design		4.1	>>>																	
Extrapolating energy of sub-TeV design			4.2	>>>																
Report on problem areas				4.3																
Adapted multi-TeV design				4.4	>>>	>>>														
Report on multi-TeV design									4.5											
Coherent pair diagnostics						4.6	>>>	>>>												
Beamstrahlung diagnostics									4.7	>>>	>>>									
Polarization diagnostics									4.8	>>>	>>>									
Report on diagnostic integration												4.9								
Optimization													4.1	>>>	>>>					
Final report																				4.1 1

3.3 Deliverables

1. Understanding of the requirements
2. Design of post-collision beam lines for sub- and multi-TeV operation
3. Integrate diagnostics in the beam line and investigate feasibility
4. Develop ideas for new diagnostics
5. Reports

4 BBSIM - Beam-Beam Simulation Code Development

Task Manager: Ph. Bambade (Orsay)

4.1 Milestones

1. Goal 1: Recruitment
 1. Milestones
 1. February 05: ILC PostDoc recruited (Cécile Rimbault)
1. Goal 2: Benchmark secondary pair generation
 1. Milestones
 1. March 05: Study relevant bibliography
 2. April 05: Study and compare production in GUINEA-PIG, CAIN and BDK generators and characterise relevant theoretical uncertainties

3. May 05: Study dependence of production on proposed ILC beam parameters and impact on rates as function of relevant detector design parameters
 4. June 05: Report on obtained results
2. Goal 3: WEB-based GUINEA-PIG documentation and program version management
 1. Milestones
 1. March 05: First study of GUINEA-PIG program structure and technical functionalities
 2. June 05: Initial WEB-based repository for multi-user code version management
 3. December 05: Initial WEB-based documentation of program features and of supported input/output conditions
 4. June 06: Detailed WEB-based program documentation
3. Goal 4: Implement beam-beam space-charge induced deflection for Bhabha processes in GUINEA-PIG
 1. Milestones
 1. September 05: First approximate evaluation of impact on luminosity determination from Bhabha scattering
 2. September 05: Technical study of Bhabha process with BHWIDE generator
 3. October 05: Study beam-beam deflection of produced Bhabha events in GUINEA-PIG and define suitable software interface
 4. November 05: Precise evaluation of impact on luminosity determination
 5. December 05: Report on obtained results
4. Goal 5: Extend phase-space for hadronic minijet generation in GUINEA-PIG
 1. Milestones
 1. January 06: Initial study of hadronic minijet production in GUINEA-PIG and bibliography relevant to photon-photon processes at low invariant mass
 2. February 06: Technical study of PYTHIA generator for photon-photon processes at low invariant mass and contact with PYTHIA main author
 3. April 06: Interface in GUINEA-PIG relevant parameterisation for total hadronic cross-section down to the pion-pair production threshold, including a basic treatment of resonance decay kinematics using PYTHIA
 4. May 06: Technical study of hadronic minijet production in GUINEA-PIG with the new interface and evaluation of impact
 5. June 06: Report on obtained results
1. Goal 6: Define default input conditions for GUINEA-PIG and document uncertainties
 1. Milestones
 1. September 06: Survey of conditions and contexts for GUINEA-PIG usage
 2. November 06: Define recommended input conditions as reference for set of defined applications, including illustrative output relevant to each

3. December 06: Adaptive computation of GUINEA-PIG grid parameters based on beam parameters and application
4. February 07: Evaluate algorithm-related uncertainties in GUINEA-PIG
5. March 07: Report on obtained results

2. Goal 7: Implement depolarising effects in GUINEA-PIG

1. Milestones

1. July 06: Study bibliography relevant to beam-beam induced depolarization
2. September 06: Introduce tracking of spin vector in GUINEA-PIG
3. October 06: Introduce beam-beam deflection induced spin diffusion in GUINEA-PIG
4. November 06: Introduce radiation-induced spin-flip spin diffusion in GUINEA-PIG
5. February 07: Technical study of beam-beam depolarizing effects in GUINEA-PIG and comparison with CAIN simulation
6. March 07: Report on obtained results

4.2 Gantt Chart

WP6: ILPS/PCDL	2005				2006				2007			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Recruitment:												
PostDoc (Cécile Rimbault)	1.1											
Benchmark secondary pair generation:												
Study relevant bibliography	2.1											
Study and compare production in GUINEA-PIG, CAIN and BDK generators and characterise relevant theoretical uncertainties	>>	2.2										
Study dependence of production on proposed ILC beam parameters and impact on rates as function of relevant detector design parameters	>>	2.3										
Report on obtained results	>>	2.4										
WEB-based GUINEA-PIG documentation and program version management:												
First study of GUINEA-PIG program structure and technical functionalities	3.1											
Initial WEB-based repository for multi-user code version management	>>	3.2										
Initial WEB-based documentation of program features and of supported input/output conditions		>>	>>	3.3								
Detailed WEB-based program documentation				>>	>>>	3.4						

Implement beam-beam space-charge induced deflection for Bhabha processes in GUINEA-PIG:													
First approximate evaluation of impact on luminosity determination from Bhabha scattering			4.1										
Technical study of Bhabha process with BHWIDE generator			4.2										
Study beam-beam deflection of produced Bhabha events in GUINEA-PIG and define suitable software interface			>>	4.3									
Precise evaluation of impact on luminosity determination			>>	4.4									
Report on obtained results				4.5									
Extend phase-space for hadronic minijet generation in GUINEA-PIG:													
Initial study of hadronic minijet production in GUINEA-PIG and bibliography relevant to photon-photon processes at low invariant mass					5.1								
Technical study of PYTHIA generator for photon-photon processes at low invariant mass and contact with PYTHIA main author					5.2								
Interface in GUINEA-PIG relevant parameterisation for total hadronic cross-section down to the pion-pair production threshold, including a basic treatment of resonance decay kinematics using PYTHIA						>>	5.3						
Technical study of hadronic minijet production in GUINEA-PIG with the new interface and evaluation of impact						>>	5.4						
Report on obtained results													
Define default input conditions for GUINEA-PIG and document uncertainties:													
Survey of conditions and contexts for GUINEA-PIG usage								6.1					
Define recommended input conditions as reference for set of defined applications, including illustrative output relevant to each								>>	6.2				
Adaptive computation of GUINEA-PIG grid parameters based on beam parameters and application								>>	6.3				
Evaluate algorithm-related uncertainties in GUINEA-PIG									>>	6.4			
Report on obtained results											6.5		
Implement depolarising effects in GUINEA-PIG:													
Study bibliography relevant to beam-beam induced depolarization								7.1					

Introduce tracking of spin vector in GUINEA-PIG							7.2				
Introduce beam-beam deflection induced spin diffusion in GUINEA-PIG							>>	7.3			
Introduce radiation-induced spin-flip spin diffusion in GUINEA-PIG							>>	7.3			
Technical study of beam-beam depolarizing effects in GUINEA-PIG and comparison with CAIN simulation								>>	7.4		
Report on obtained results									7.4		

4.3 Deliverables

1. Comparison of GUINEA-PIG and CAIN simulations and benchmarking using other specialized generators with a view to estimate uncertainties
2. WEB-based GUINEA-PIG documentation and program version management
3. Improved version of GUINEA-PIG including treatments of beam-beam deflections for Bhabha processes, extended phase-space coverage for hadronic minijets and depolarizing effects
4. Reports

5 HTGEN - Halo and Tail Generator

Task Manager: H. Burkhardt (CERN)

The objective is to develop and collect information and code on halo and tail generation relevant for linear colliders. This work will be done by a small group based at CERN (H.B. + 1 Fellow) in close collaboration with the related international activities, and in particular the related tasks on beam delivery and collimation (BDSIM, COLSIM) within the WP6 on Integrated Luminosity Performance Studies.

5.1 Milestones

- Goal 1. Recruitment
 - Milestones
 - May 05: Fellow selected (Lionel Neukermans)
 - Sep 05: Planned start date for Fellow.
- Goal 2. Establish a comprehensive list of Halo candidate processes.
 - Milestones
 - January 2005. First preliminary list of halo processes. Done: <http://hbu.home.cern.ch/hbu/HTGEN.html>
 - December 2005. First detailed list of halo candidate processes with literature and code references.
 - Summer 2006. Second version with literature and code references and any direct links to new code.
- Goal 3. Development of analytical models of halo were appropriate.
 - Milestones

- December 2005. Establish a list of halo processes for which analytical models can be appropriate.
- Summer 2006. Preliminary description of analytical halo models.

- Goal 4. Development of computer models for halo tail generation.
 - Milestones
 - Dec 2005. Direct synchrotron spectrum generator and its implementation in Geant4.
 - Summer 2006. Detailed list of new codes needed and first preliminary codes.

- Goal 5. Simulation studies of halo/tail generation
 - Milestones
 - Dec 2005. Preliminary list of topics to be studied by simulation.
 - Autumn 2006. More detailed list and first results

- Goal 6. Explore possibilities for benchmarking
 - Milestones
 - Dec 2005. List few possible experiments on halo.
 - Summer 2006. Strategy for benchmarking.

5.2 Deliverables

The deliverables in Jan 2008 are the following.

1. Comprehensive description of halo/tail processes
2. Computer codes and were appropriate analytical models for selected
3. halo/tail processes
4. Strategy and possible results of benchmarking of halo/tail processes.

6 COLSIM - Collimation Simulation

Task Manager: G. Blair (RHUL)

The collimation simulation task works in close collaboration with the BDSLD task in workpackage 2.

6.1 Milestones

- Goal 1: Recruitment
 - Milestones
 - Jun05: Closing date for Manchester Post Doc. Applications.
 - Jun05: DESY PostDoc recruited (Ramilia Amazonas).
 - Sep05: Fellow recruited at CERN (Maxim Korostelev).

- Goal 2: Software development
 - Milestones BDSIM
 - Jun05: Beta release of BDSIM including prototype MAD interface.
 - Implementation of thick non-linear elements (e.g Sextupoles) in BDSIM.

- Goal 3: Halo tracking and Simulation
 - Milestones
 - Aug05: First results of ILC halo collimation using BDSIM.
 - Jun05: Presentation of wake-field effects, calculated using Merlin.
 - Aug05: Presentation of Halo tracking using Merlin.
 - Apr06: Report on BDSIM results.
 - Apr06: Report on Merlin results.
 - Jun06: Efficiency studies for non-linear collimation system

- Goal 4: Collimator survival simulations
 - The task will participate into studies of the collimator survival in workpackage 2 by providing data on expected losses

- Goal 5: Neutrons
 - Milestones
 - Jun05: Present strategies for implementing neutron tracking code.
 - Aug05: First results on neutron simulation
 - Jan06: Preliminary report on neutron production in beam dumps.

- Goal 6: Muons
 - Milestones
 - Aug05: Preliminary update of muon production calculations for ILC
 - Apr06: Report on ILC BDS performance with regard to muons.

- Goal 7: IR region layout
 - Milestones
 - Aug05: First simulations of 2 mrad crossing angle IR region in BDSIM.
 - Apr06: Comparative study of 2mrad and 20 mrad IR regions.

6.2 Gantt Chart

WP6: COLSIM												
Financial Year	Jan 05				Jan 06				Jan 07			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Recruitment												
PostDoc		==	1.1									
Halo tracking and Simulation			==	==	==	==						
BDSIM	==	2.1	2.2	==	==	2.3	==	==	==	==	==	==
Merlin	==	2.4	2.5	==	==	2.6	==	==	==	==	==	==
Neutrons												
Dump-related neutron production	==	4.1	4.2	==	==	4.3	==	==				
Muons												
ILC muon tracking		==	5.1	==	==	5.2	==	==	==	==	==	==
IR Layout												
BDSIM simulations	==	==	6.1	==	==	6.2	==	==	==	==	==	==

6.3 Deliverables

1. Apr06: BDSIM code alpha-release v1.
2. Jun05: Preliminary Report on Merlin wakefield simulations.
3. Apr06: Report on muon and neutron simulations.
4. Apr06: Report on comparative study of 2 mrad and 20 mrad IRs.
5. Apr06: Report on ANSYS collimator survival calculations.
6. Apr06: Full report on Merlin wakefield simulations.

7 FMSIM - Failure Mode & Effect Simulation

Task Manager: N. Walker (DESY)

7.1 Milestones

- Goal 1: Identify primary LET failure modes
 - Milestones:
 - June 2005: draft list of critical failure modes
 - August 2005: agree internationally on prioritised failure mode catalogue at ILC Snowmass Workshop.
 - August 2005: Specification of phase 1 (single-bunch) and phase 2 (multi-bunch) failure modes for implementation plan.
- Goal 2: Identify software requirements
 - Milestones:
 - June 2005: review of existing software tools (for possible use for FM simulations)
 - July 2005: First implementation plan for phased software development.
- Goal 3: Phase 1 software model development
 - Milestones:
 - October 2005: Full ILC LET lattice available (*external requirement*)
 - December 2005: first release of FM simulation tools (including detailed RF model) complete and documented
- Goal 4: Phase 1 FM simulations
 - Milestones:
 - March 2006: first results of phase 1 RF-related single-bunch failure modes, plans for second iteration
 - June 2006: final results of phase-1 RF related single-bunch failures (presented to June EUROTeV workshop)
 - June 2006: Implementation plan for further 12 months activity (phase 1+2).
 - Report on RF-related machine protection strategy.

7.2 Gantt Chart

7.3 Deliverables

1. Prioritised list (report) of critical failure modes (August 2005)

2. FM Simulation code for the ILC LET system, including RF system (December 2005)
3. Interim report on single-bunch RF-related failure modes (February 2006)
4. Final report and recommendations for fast RF related failure modes (June 2006)
5. Implementation plan for phase 1+2 studies June 2006 - June 2007 (June 2006)

8 LAST - Luminosity and Alignment Studies

Task Manager: P.N. Burrows (QMUL)

The objectives are to develop an alignment and feedback strategy in order to optimise the luminosity performance of the linear collider. For this purpose software tools will need to be developed to evaluate the luminosity performance in the low emittance transport systems. For these purposes a task www site will be set up [1]. This work involves international collaboration with groups at SLAC, Fermilab, Cornell, KEK and elsewhere. In particular, bunch compressor simulations will be carried out at SLAC so we concentrate on linac and BDS transport simulations. Also a close link needs to be maintained with the instrumentation experts in workpackage 5 and the alignment and stabilisation experts in workpackage 7 which both will provide important input.

Some preliminary results have been presented at the Particle Accelerator Conference [2], and will be updated at the Beam Delivery/Interaction Region (BDIR) Workshop in June 2005.

8.1 Milestones

- Goal 1. Recruitment:
 1. May 2005: Fellow recruited at CERN (Andrea Latina)
- Goal 2. Set up www page environment for task.
 1. July 2005: www site available.
- Goal 3. Develop a code package to simulate beam transport from the exit of the Damping Ring through to the Interaction Point and the extraction line, including component misalignments, ground motion and vibration sources.
 1. June 2005: Benchmarking of the beam core tracking in different codes, namely SAD, MAD and PLACET.
 2. December 2005: First version code release and documentation.
 3. June 2006: Implementation of the most relevant beam-based alignment, feedback and tuning strategies. Second code release.
 4. December 2006: Code-to-code comparisons for the most relevant strategic steps. This will be performed in an international framework.
- Goal 4. Develop a beam-based main linac alignment strategy
 1. May 2005: Study of the performance of dispersion free steering in the CLIC main linac.
 2. December 2005: Perform the simulations for the ILC to benchmark against studies performed in the US and Japan.
- Goal 5. Develop a main linac tuning strategy

1. May 2005: Developed a first strategy of main linac emittance and luminosity tuning bumps and applied it to CLIC.
 2. June 2006: Study the performance of linac tuning in presence of dynamic imperfections.
 3. June 2006: Develop strategy to mitigate the effect of RF jitter phase jitter induced by the drive beam.
- Goal 6. Design of ILC BDS beam-based feedback system(s) including component specifications and locations.
 1. August 2005: Baseline design.
 2. June 2006: Preliminary engineered design in preparation for ILC CDR.
 - Goal 7. Develop BDS beam-based alignment strategy.
 1. December 2005: First version of strategy.
 2. July 2006: Improved strategy in preparation for ILC CDR.
 - Goal 8: Develop BDS beam-based feedback and tuning strategy.
 1. August 2005: First version of strategy.
 2. June 2006: Improved strategy in preparation for ILC CDR.
 - Goal 9: Incorporate BDS feedback and tuning strategy into global low-emittance transport luminosity optimization strategy.
 1. December 2006: Baseline strategy as part of ILC CDR.
 - Goal 10: Develop an optimisation strategy for the collision parameters.
 1. June 2006: Develop an IP tuning strategy to optimise the collision parameters for ILC and CLIC machine.

8.2 Deliverables

The deliverables in January 2008 are the following:

1. Documented code package for beam transport from Damping Ring to IP.
2. Optimised engineered design for ILC BDS beam-based feedback system(s).
3. BDS beam-based alignment strategy.
4. BDS beam-based feedback and tuning strategy.
5. Global low-emittance transport feedback and tuning strategy.

References

[1] Task www site TBA

[2] PAC papers:

1567 - RPPP013: P.N. Burrows et al, Tests of the FONT3 Linear Collider Intra-Train Beam Feedback System at the ATF.

1128 - RPPP014: G. White, D. Schulte, N.J. Walker, Multi-Bunch Simulations of the ILC for Luminosity Performance Studies.

2132 - RPPP015: G. White, Reconstruction of IP Beam Parameters at the ILC from Beamstrahlung.

EUROTeV-Report-2005-004-1: D. Schulte, Different Options for Dispersion Free Steering in the CLIC Main Linac.

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9 Conclusion

The workplan of the ILPS work package has been defined. It is integrated into the international framework. A first round of results will be provided in the middle of 2006.

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