

ILPS in 2008

D. Schulte for the ILPS team

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Institutes

- CERN, DESY, LAL, Lancaster University, University of Manchester, University of Oxford, PSI, Queen Mary - University of London, RHUL, Uppsala Universitet, Universitat de Valencia

Tasks

- FMSIM, N. Walker (DESY, CERN)
- COLSIM, G. Blair (RHUL, UL, UM, DESY, CERN, UVAL)
- LAST, Ph. Burrows (UO, CERN, DESY)
- HTGEN, H. Burkhard (CERN)
- BCDES, M. Pedrozzi (PSI)
- PCDL, V. Ziemann/Ph. Bambade (UU, LAL)
- BBSIM, Ph. Bambade (LAL, CERN)

FMSIM

- Work restarted at DESY
 - Simulation of main linac failures and beam delivery system
 - Spoilers can be damaged
 - But in no simulated case detector would have been damaged
- At CERN
 - Decelerator is critical and different from ILC
 - Failure of quadrupoles, PETS inhibition and PETS RF breakdown were studied
 - Simultaneous failure of two quadrupoles can lead to significant losses
 - Inhibition of larger number of PETS is acceptable (1/3)
 - Transverse voltage of 50-200kV is acceptable in PETS breakdown
 - Steered machine performs better than unsteered also for failures

COLSIM

- Lancaster
 - More accurate wakefield calculations
- Manchester
 - Higher order wakefields are not important
 - Resistive wall wakefields
- RHUL
 - BDSIM has been further improved, in particular the interface to PLACET

LAST

- DESY
 - LICAS survey model included into MERLIN
 - RF coupler effects in ILC studied
 - Impact very small as predicted kick amplitude decreased
 - MERLIN has been made available
- Oxford
 - Integrated multi-bunch simulations of ILC main linac and intra-pulse interaction point feedback
 - 85% of luminosity recovered in noisy conditions (model C)
 - Studies of intra-pulse feedback at IP of CLIC
 - no excessive losses of coherent pairs in BPM
 - Feedback can be applied at CLIC

LAST

- CERN
 - Application of beam-based alignment to derive detailed specifications of components
 - Beam-based alignment in decelerator
 - Found that 100A beam can be safely handled
 - Beam tests of algorithms in CTF3
 - Translation of beam tolerances into structure tolerances
 - Further improvement of beam delivery system alignment procedure
 - For ATF2 and CLIC
 - New code to study fast beam ion instability in linac
 - Found that 10ntorr could be acceptable
 - PLACET improvements, still on SAVANNAH server

HTGEN

- CERN
 - Integration of package into PLACET improved
 - Documentation provided
 - Loss studies in CLIC beam delivery system
 - Karlsruhe started to use package to estimate losses in drive beam complex

BCDES

- PSI
 - Repetition of studies on main beam bunch compressors for new CLIC parameters
 - CSR in arc cell studied
 - Repetition and refinement of studies on tuning chicane and turn-around
 - Adjust to new CLIC parameters
 - 1D CSR studies confirmed by 3D studies

PCDL

- Uppsala
 - Adaptation of post collision line layout to new CLIC parameters
 - Solutions for vacuum window investigated
 - Instrumentation potential in post collision line investigated and documented
- LAL
 - Completion of 2mradian line for ILC
 - Potential to measure beam profiles explored

BBSIM

- LAL
 - Implementation of depolarisation in GUINEA-PIG++
 - Spin precession
 - Spin flip
 - Further improvement and documentation of GUINEA-PIG++

Deliverables

- Advanced software package(s) for modelling luminosity performance
 - EUROTeV 2008-088
- Report on luminosity tuning and control strategy
 - EUROTeV report 2008-090
- Report on failure modes and their effect
 - EUROTeV 2008-075
- New version of GUINEA-PIG
 - EUROTeV 2008-067
- Design report on multi-TeV bunch compressors system
 - EUROTeV 2008-086
- Report on possible performance of post-collision diagnostics
 - EUROTeV 2008-063
- Computer models for halo and beam-tail generation
 - EUROTeV 2008-076
- Report on performance of collimation system
 - EUROTeV 2008-089

Conclusion

- ILPS achieved all deliverables
- A few unforeseen tasks have been absorbed into the programme
- There is a clear path into the future
- We managed to suck a few new experts into the field
- I would like to thank all the experts for their valuable contributions