



# News from FP7 Meeting at CERN E.Elsen

ESGARD Open Meeting on FP7-IA

<http://esgard-omia.web.cern.ch/ESGARD-OMIA/Programme.html>

# Programme

- New Acceleration Systems  
E Jensen
- High Intensity, High Energy Proton Beam  
R Garoby
- SC RF Acceleration System  
O Napoly

# New Acceleration Systems

- High gradient NC RF structures; W. Wuensch
- Beam Transport Issues (LED and EURODrive); D. Schulte
- Damping Ring, Small Emittance Issues; H. Braun
- FFAG related studies; F. Meot
- Polarized Positron Sources; A. Variola
- MICE: Muon cooling experiments; P. Kyberd
- Additional ILC high-priority topics; P. Burrows

# High Intensity, High Energy Proton Beam

- Net: "EURO-Lumi" (LHC Luminosity upgrade); W. Scandale
- Net: "MEGLIO" (Neutrino Facilities); V. Palladino
- JRA: High Field Magnets; G. De Rijk
- TA: "CryoMagNet" (SC cable tests); L. Walckiers
- JRA: "HTS\_L" (High Temperature SC Link); A. Ballarino
- JRA: "ColMat" (Collimators and targets Materials); R. Assmann
- TA: "HiRadMat" (Irradiation tests); R. Assmann
- JRA: "SC3PPL" (SC Cavities and Cryomodule for a Pulsed Proton linac); R. Garoby

# SC RF Acceleration System

- High gradient cavities beyond ILC and CNI-PP; D. Proch
- Prototype Cavities (Crab, CWERL, 3.9 GHz); P. Mac Intosh
- Quarter Wave cavities Nb/Cu; M. Pasini
- Thin Films Cavities; B. Visentin
- RF Gun (CW, positrons, thin film cathodes); J. Sekutowicz
- FLASH acc. experiment: HOMPM; R. Jones
- FLASH acc. experiment: LLRF; M. Grecki
- ELBE acc. experiments; J. Teichert
- JRA activities on RF Infrastructures:
- RF Test Infrastructure in Europe; W. Weingarten

# General Comments

- A typical FP7 Infrastructure proposal should shoot for 5 M€ support from the EU; exceptional consortia may try 15 M€
- Programmes should be designed for a matching fund of 2:1
- HEP should prepare a proposal for 20 M€

# Current situation

- Whole bid adds up to ~120 M€
- Reduce by factor 2

# Structure of the Proposal

- One single proposal from HEP
- Rearrange according to strategic requirements?
  - LHC
  - ILC/CLIC
  - High intensity proton beams
  - Novel acceleration schemes



# ILC Topic – SRF

- SRF
  - Single crystal
  - LLRF
  - HOM Studies
  - Infrastructure: Saclay  
CERN is planning on installing a  
infrastructure for SPL

# ILC Topic – $e^+$ -Source

- Undulator-based source (ILC baseline)
  - undulator + target prototypes
  - polarisation + spin tracking (also CLIC)
  - pre-industrial undulator section prototype
  - Daresbury target facility
  - RAL undulator facility
- 3.5ME total, 0.8ME requested
  - + 0.75ME, 0.25ME requested

# ILC Topic – $e^+$ -Source

- LAL Orsay, IPN Lyon, Frascati
- Compton-based source, CLIC ‘baseline’ (ILC alternative):
  - fibre laser
  - capture section RF cavity
- FLASH, CTF3, DAFNE, ATF
- 1.7ME total, 0.6ME requested
  - + 0.75ME total, 0.25ME requested

# ILC Topic – Damping Rings

- CERN, Frascati, Cockcroft
- DR vacuum systems (ILC + CLIC):
  - e-cloud studies and mitigation eg. NEG coatings
  - design of chamber components
- DAFNE: tests of coatings for suppressing e-cloud
- Light sources (ANKA, SLS, ESRF...): meas. of yields
- CERN + Cockcroft Vacuum Labs: prep./study coatings
- 2.3ME total, 0.7ME requested

# ILC Topic – Beam Transport

- Beamline design + beam simulation
- Collimator wakefields
- Instrumentation:
  - Laserwire
  - Luminometer + polarimeter
  - BPMs for beam delivery system
  - Alignment monitoring
  - Beam dump feasibility study + design

# Instrumentation: Laserwire

- RHUL, Oxford (DESY, KEK)
  - 2-d fast scanning (PETRA III)
  - Micron-scale beam profile measurement (ATF2)
  - Input emittance reconstruction to ILC/CLIC simulations
  - Development of fibre-based laser system
  - PETRA III, ATF2

# Instrumentation: Alignment monitoring + FB

- Oxford (Annecy, CERN, KEK ...)
  - Develop alignment monitoring system for CLIC
  - Prototype / demonstrator at CTF3
  - Build on ILC prototype at ATF2
  - Integrate alignment monitoring into global low-emittance transport + feedback simulation for ILC/CLIC
  - Develop luminosity tuning techniques and optimisation strategy for ILC/CLIC
  - CTF3, ATF2

# Instrumentation: BPM development

- RHUL, UCL (KEK, CERN...)
  - Commission C- and S-band BPM systems at ATF2
  - Optimisation of BDS commissioning and tuning strategy
  - New BPM system design for CLIC/ITB
  - CTF3/ITB, ATF2



# Instrumentation: luminometer/ polarimeter

- LAL, Univ. Paris Sud 11, Orsay (CERN, KEK)
- Design + development of combined luminometer / polarimeter based on Compton events at IP
- Detailed specification of laser requirements
- Study post-IP instrumentation for beam monitoring
- Evaluation of backgrounds from particle losses in IR
- Development of BDSIM
- CTF3, ATF2

# Beamline design + beam simulation

- RHUL, Oxford (DESY, CERN, KEK)
  - Develop BDSIM, interface to PLACET
  - BDS / linac interface
  - Simulate diagnostics performance (laserwire)
  - Benchmarking against data
  - ATF2, CTF3, PETRA III

# Short-range collimator wakefields

- Manchester
  - Compilation of delta-wake formulae, regions of validity
  - Benchmarking, coding
  - Wakefield library: materials, shapes
  - Implementation in MERLIN, PLACET ...
  - Emittance growth in ILC + CLIC BDS
  - Software infrastructure: wakefield library + codes

# Beam dumps

- RAL, Cockcroft, Uppsala, DESY (CERN, KEK)
  - Feasibility of water dump concept
  - Energy deposition in window and water
  - Power dissipation and shockwaves
  - Benchmark simulations + window tests
  - Alternative technologies: noble gas dump
  - CTF3, ATF2

# Summary: Beam Transport

Instrumentation		Total	Req
	Laserwire	2.9	0.9
	Luminometer+polarimeter	1.1	0.3
	BPMs	0.7	0.2
	Alignment	2.1	0.6
Beamline Design		0.4	0.1
Collimator wakefield		1.0	0.3
Beam Dump Design		0.9	0.3

# Conclusion

- Current status: 30 M€, ~10 M€ high priority
- ILC priority list required
- European GDE director
  - PMs
  - R&D Board
- Lab Directors need a clear proposal by October 15 with planned commitments