

## ILC Damping Rings Researchers' Activities

17-Aug-07

### **Kazunori Akai, KEK (kazunori.akai@kek.jp)**

\* 3.6.1.B RF system test in KEKB *Proposed* 17-May-07

### **David Alesini, INFN-LNF (david.alesini@lnf.infn.it)**

\* 3.5.1.E Development of stripline electrodes for fast kickers *Proposed* 10-Aug-06

3.5.1.F Laboratory test of FID fast high-power pulser *Active* 10-Aug-06

### **Jim Alexander, Cornell (jima@lns.cornell.edu)**

\* 3.7.3.B Develop instrumentation for monitoring emittance damping (including testing and operation in CESR-c and CesrTA) *Active* 17-May-07

### **James Amundson, FNAL (amundson@fnal.gov)**

2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### **Alexander Aryshev, KEK (alar@post.kek.jp)**

\* 2.2.5.K CSR studies at KEK-ATF *Active* 11-Aug-06

### **Albert Babayan, YerPhi (babaian@yerphi.am)**

\* 3.2.6.A Optimize design of permanent magnet wiggler *Active* 10-Aug-06

### **Karl Bane, SLAC (kbane@slac.stanford.edu)**

\* 2.2.1.A Develop an impedance budget and specify feedback systems *Active* 17-May-07

2.2.1.D Calculate impedance of vacuum chamber components *Proposed* 17-May-07

2.2.3.G Studies of clearing electrodes for suppressing electron cloud build-up *Proposed* 17-May-07

### **Walter Barry, LBNL (Walter\_Barry@lbl.gov)**

3.7.5.B Development of betatron tune monitor and coherent signal receiver *Proposed* 17-May-07

3.8.1.A Development of the transverse broadband multibunch feedback systems *Active* 17-Aug-07

3.8.1.B Characterize injection noise *Proposed* 10-Aug-06

### **Marica Biagini, INFN-LNF (Marica.Biagini@lnf.infn.it)**

2.1.2.C Study of beam dynamics with wigglers *Proposed* 10-Aug-06

### **Mike Billing, Cornell (mgb@cesr10.lns.cornell.edu)**

\* 3.7.5.A Develop methodology for fast dispersion measurements (including testing and operation in CESR-c/CesrTA) *Inactive* 12-May-07

### **Neil Bliss, Daresbury (n.bliss@dl.ac.uk)**

3.1.1.F Arcs vacuum system technical design *Active* 17-May-07

### **Roberto Boni, INFN-LNF (Roberto.Boni@lnf.infn.it)**

\* 3.6.1.A RF cryogenic system specification *Active* 17-May-07

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Michael Borland, ANL (borland@aps.anl.gov)

- \*2.2.5.M CSR modeling *Proposed* 21-Aug-06
- 2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### Craig Brooksby, LLNL (brooksby1@llnl.gov)

- 3.5.1.A Development of high-availability injection/extraction kicker (SLAC/LLNL) *Active* 17-May-07

### Warner Bruns, CERN (Warner.Bruns@cern.ch)

- \*2.2.3.R Develop a PIC code for computing electron cloud and ion effects *Active* 20-Sep-06
- 2.2.4.I Characterize ion effects in the damping rings *Completed* 20-Sep-06

### John Byrd, LBNL (JMBYrd@lbl.gov)

- \*2.2.2.F Multibunch impedance *Active* 17-Aug-07
- \*2.2.3.I CesrTA wiggler and electron cloud studies *Proposed* 17-May-07
- \*2.2.4.A Experimental studies of fast ion instability at the LBNL-ALS *Active* 17-Aug-07
- \*2.2.5.J Study of CSR effects at KEK-ATF *Proposed* 17-May-07
- \*3.6.4.A Develop low-level RF systems *Proposed* 17-May-07
- \*3.7.5.B Development of betatron tune monitor and coherent signal receiver *Proposed* 17-May-07
- \*3.8.1.A Development of the transverse broadband multibunch feedback systems *Active* 17-Aug-07
- \*3.8.1.B Characterize injection noise *Proposed* 10-Aug-06
- \*4.2.1.A ATF kicker development *Active* 17-Aug-07

### Yunhai Cai, SLAC (yunhai@slac.stanford.edu)

- \*2.1.2.B Dynamic aperture studies *Proposed* 17-May-07
- \*2.1.3.A Specify correction systems *Proposed* 17-May-07

### Maria Carballo, SLAC ()

- 3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Giorgio Cavallari, CERN (giorgio.cavallari@cern.ch)

- 3.6.1.A RF cryogenic system specification *Active* 17-May-07

### Christine Celata, LBNL (cmcelata@lbl.gov)

- \*2.2.3.A Model electron cloud instability *Active* 17-Aug-07

### Yong-Chul Chae, ANL (chae@aps.anl.gov)

- \*2.2.1.F Single bunch impedance *Proposed* 21-Aug-06
- 2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### Scott Chapman, Cornell (ssc@lepp.cornell.edu)

- 2.1.4.C Specify the alignment tolerances and stabilization requirements for the damping rings *Active* 17-May-07

**Roberto Cimino, INFN-LNF (Roberto.Cimino@Inf.infn.it)**

|           |  |                 |           |
|-----------|--|-----------------|-----------|
| * 2.2.3.H | Electron cloud studies in DAFNE  | <i>Proposed</i> | 10-Aug-06 |
| 2.2.3.N   | Benchmarking of electron-cloud build-up simulations                          | <i>Active</i>   | 20-Sep-06 |
| 2.2.3.O   | Improvement of electron-cloud simulation codes                               | <i>Active</i>   | 20-Sep-06 |
| 2.2.3.P   | Predict electron-cloud effect in the damping rings                           | <i>Active</i>   | 20-Sep-06 |
| 2.2.3.Q   | Experimental determination of surface parameters for electron-cloud build-up | <i>Active</i>   | 20-Sep-06 |
| 3.1.1.E   | Vacuum design of damping rings   | <i>Active</i>   | 20-Sep-06 |

**Alberto Clozza, INFN-LNF (Alberto.Clozza@Inf.infn.it)**

|         |                                 |                 |           |
|---------|---------------------------------|-----------------|-----------|
| 2.2.3.H | Electron cloud studies in DAFNE | <i>Proposed</i> | 10-Aug-06 |
|---------|---------------------------------|-----------------|-----------|

**Gerry Codner, Cornell (gcodner@lepp.cornell.edu)**

|         |  |               |           |
|---------|--|---------------|-----------|
| 2.2.4.E | Studies of fast ion instability (modelling and experimental) | <i>Active</i> | 17-May-07 |
|---------|--|---------------|-----------|

**Gerard Collet, SLAC (collet@SLAC.Stanford.EDU)**

|         |  |               |           |
|---------|--|---------------|-----------|
| 2.2.3.F | Electron cloud lab measurements and PEP-II studies | <i>Active</i> | 17-May-07 |
|---------|--|---------------|-----------|

**Ed Cook, LLNL (cook5@llnl.gov)**

|         |  |               |           |
|---------|--|---------------|-----------|
| 3.5.1.A | Development of high-availability injection/extraction kicker (SLAC/LLNL) | <i>Active</i> | 17-May-07 |
|---------|--|---------------|-----------|

**Jim Crittenden, Cornell (critten@lns.cornell.edu)**

|           |   |                 |           |
|-----------|---|-----------------|-----------|
| * 2.2.3.D | Studies of electron-cloud build-up and instabilities with simulation and experiment | <i>Proposed</i> | 17-May-07 |
| * 2.2.4.E | Studies of fast ion instability (modelling and experimental)                        | <i>Active</i>   | 17-May-07 |

**Stefano de Santis, LBNL (SDeSantis@lbl.gov)**

|         |  |                 |           |
|---------|--|-----------------|-----------|
| 2.2.3.G | Studies of clearing electrodes for suppressing electron cloud build-up | <i>Proposed</i> | 17-May-07 |
| 2.2.3.I | CesrTA wiggler and electron cloud studies                              | <i>Proposed</i> | 17-May-07 |
| 2.2.4.A | Experimental studies of fast ion instability at the LBNL-ALS           | <i>Active</i>   | 17-Aug-07 |
| 2.2.5.J | Study of CSR effects at KEK-ATF  | <i>Proposed</i> | 17-May-07 |
| 4.2.1.A | ATF kicker development   | <i>Active</i>   | 17-Aug-07 |

**Winfried Decking, DESY (winfried.decking@desy.de)**

|           |                              |                 |           |
|-----------|------------------------------|-----------------|-----------|
| * 2.1.2.D | Wiggler studies in PETRA-III | <i>Proposed</i> | 11-Aug-06 |
|-----------|------------------------------|-----------------|-----------|

**Jean-Pierre Delahaye, CERN (Jean-Pierre.Delahaye@cern.ch)**

|           |   |                 |           |
|-----------|---|-----------------|-----------|
| * 2.2.5.L | Theoretical studies of intrabeam scattering | <i>Active</i>   | 11-Aug-06 |
| * 3.4.6.B | Development of superconducting wiggler      | <i>Active</i>   | 11-Aug-06 |
| * 3.7.3.C | Instrumentation development                 | <i>Proposed</i> | 11-Aug-06 |

## ILC Damping Rings Researchers' Activities

17-Aug-07

### John Dobbins, Cornell (jad@lepp.cornell.edu)

- |         |   |        |           |
|---------|---|--------|-----------|
| 3.7.3.B | Develop instrumentation for monitoring emittance damping (including testing and operation in CESR-c and CEsrTA) | Active | 17-May-07 |
|---------|---|--------|-----------|

### Larry Doolittle, LBNL (ldoolitt@recycle.lbl.gov)

- |         |   |          |           |
|---------|---|----------|-----------|
| 3.6.4.A | Develop low-level RF systems                                      | Proposed | 17-May-07 |
| 3.7.5.B | Development of betatron tune monitor and coherent signal receiver | Proposed | 17-May-07 |
| 3.8.1.B | Characterize injection noise                                      | Proposed | 10-Aug-06 |

### Alessandro Drago, INFN-LNF (Alessandro.Drago@lnf.infn.it)

- |          |                                      |          |           |
|----------|--------------------------------------|----------|-----------|
| *3.8.1.D | Development of fast feedback systems | Proposed | 10-Aug-06 |
|----------|--------------------------------------|----------|-----------|

### Gerry Dugan, Cornell (gfd1@cornell.edu)

- |         |   |          |           |
|---------|---|----------|-----------|
| 3.4.6.A | Develop physics design for damping wigglers | Inactive | 12-May-07 |
|---------|---|----------|-----------|

### Kazumi Egawa, KEK (kazumi.egawa@kek.jp)

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|----------|--------------------|----------|-----------|
| *4.1.1.C | Effects of wiggler | Proposed | 19-Sep-06 |
|----------|--------------------|----------|-----------|

### Richard Ehrlich, Cornell (rde4@cornell.edu)

- |         |  |          |           |
|---------|--|----------|-----------|
| 3.4.6.C | Develop engineering design for ILC damping wigglers based on CESR-c superconducting wiggler design | Proposed | 17-May-07 |
|---------|--|----------|-----------|

### Mike Ehrlichman, Minnesota (ehrichman@Physics.umn.edu)

- |         |  |        |           |
|---------|--|--------|-----------|
| 2.2.5.H | Simulation of the Touschek lifetime and intrabeam scattering effects with measurements in CEsrTA | Active | 17-May-07 |
|---------|--|--------|-----------|

### Eckhard Elsen, DESY (eckhard.elsen@desy.de)

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|---------|---------------------------------|--------|-----------|
| 2.2.4.D | Studies of fast ion instability | Active | 11-Aug-06 |
|---------|---------------------------------|--------|-----------|

### Louis Emery, ANL (emery@aps.anl.gov)

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|----------|---|----------|-----------|
| *2.1.1.C | Damping ring lattice design and optimization          | Active   | 17-May-07 |
| *2.1.1.G | Alternative ring designs                              | Proposed | 11-Aug-06 |
| *2.1.3.B | Orbit and coupling correction and tuning studies      | Proposed | 17-May-07 |
| *2.2.2.E | Multi-bunch instability with Monte Carlo HOM modeling | Proposed | 21-Aug-06 |
| *2.2.3.S | Model electron cloud instability                      | Proposed | 18-May-07 |
| *2.3.1.A | Integrated modeling of damping ring beam dynamics     | Proposed | 11-Aug-06 |

### John Flanagan, KEK (john.flanagan@kek.jp)

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|----------|---|----------|-----------|
| *2.2.3.M | Measurement of electron cloud instabilities | Proposed | 19-Sep-06 |
|----------|---|----------|-----------|

### John Fox, SLAC (jdfox@SLAC.Stanford.EDU)

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|----------|--|----------|-----------|
| *2.2.2.D | Fast feedback system specifications                  | Proposed | 17-May-07 |
| *3.6.4.B | Design studies for damping rings low level RF system | Proposed | 17-May-07 |
| *3.8.1.C | Fast feedback system development                     | Proposed | 17-May-07 |

## ILC Damping Rings Researchers' Activities

17-Aug-07

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### Joe Frisch, SLAC (frisch@slac.stanford.edu)

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Hitoshi Fukuma, KEK (hitoshi.fukuma@kek.jp)

2.2.3.L Experiments on suppression of electron cloud effect *Proposed* 19-Sep-06

### Jie Gao, IHEP (gaoj@ihep.ac.cn)

2.1.1.F Damping rings optics design *Inactive* 12-May-07

\*2.2.1.C Characterize single-bunch collective effects *Proposed* 11-Aug-06

### George Gollin, UIUC (g-gollin@mail.physics.uiuc.edu)

\*3.5.1.D Development of fast injection/extraction kickers *Active* 17-May-07

### Alan Grant, Daresbury (a.f.grant@dl.ac.uk)

3.1.1.F Arcs vacuum system technical design *Active* 17-May-07

### Susanna Guiducci, INFN-LNF (Susanna.Guiducci@lnf.infn.it)

\*2.1.2.C Study of beam dynamics with wigglers *Proposed* 10-Aug-06

### Don Hartill, Cornell (dlh13@cornell.edu)

2.1.4.C Specify the alignment tolerances and stabilization requirements for the damping rings *Active* 17-May-07

### Hitoshi Hayano, KEK (hitoshi.hayano@kek.jp)

4.2.1.B Development of fast rise/fall time kicker for ATF/ATF2 *Active* 11-Aug-06

### Sam Heifets, SLAC (heifets@slac.stanford.edu)

2.2.1.A Develop an impedance budget and specify feedback systems *Active* 17-May-07

\*2.2.1.D Calculate impedance of vacuum chamber components *Proposed* 17-May-07

\*2.2.5.E Characterize classical single- and multi-bunch instabilities *Active* 17-May-07

\*3.1.1.C Coordinate design of damping ring vacuum system and control the impedance budget *Proposed* 17-May-07

### Richard Helms, Cornell (helms@lepp.cornell.edu)

2.1.4.B Develop low-emittance tuning strategies with validation in CEsrTA *Active* 17-May-07

2.1.4.C Specify the alignment tolerances and stabilization requirements for the damping rings *Active* 17-May-07

3.7.5.A Develop methodology for fast dispersion measurements (including testing and operation in CESR-c/CesrTA) *Inactive* 12-May-07

### Robert Holtzapple, Alfred U (holtzapple@alfred.edu)

2.2.3.D Studies of electron-cloud build-up and instabilities with simulation and experiment *Proposed* 17-May-07

2.2.4.E Studies of fast ion instability (modelling and experimental) *Active* 17-May-07

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Gang Huang, LBNL (ghuang@lbl.gov)

2.2.4.A Experimental studies of fast ion instability at the LBNL-ALS *Active* 17-Aug-07

### James Jones, ASTeC (j.k.jones@dl.ac.uk)

2.1.4.A Low-emittance tuning techniques and requirements *Active* 17-May-07

### Roger Jones, Manchester/CI (rmj@slac.stanford.edu)

2.2.1.B Develop single-bunch impedance models and characterize instabilities *Proposed* 17-May-07

### Jin-Young Jung, LBNL (JYJung@lbl.gov)

3.1.1.A Damping rings wiggler and straights vacuum system design *Active* 17-Aug-07

### Ken-ichi Kanazawa, KEK (ken-ichi.kanazawa@kek.jp)

2.2.3.L Experiments on suppression of electron cloud effect *Proposed* 19-Sep-06

### Pavel Karataev, RHUL (karataev@post.kek.jp)

2.2.5.K CSR studies at KEK-ATF *Active* 11-Aug-06

### Eun-San Kim, KNU (eskim1@knu.ac.kr)

\*2.1.1.E Damping rings optics design *Proposed* 28-Apr-06

2.2.4.C Studies of fast ion instability *Active* 28-Apr-06

4.1.1.A ATF beam dynamics and instrumentation studies *Active* 11-Aug-06

### Bob Kirby, SLAC (rek@slac.stanford.edu)

2.2.3.F Electron cloud lab measurements and PEP-II studies *Active* 17-May-07

2.2.3.K Studies of grooved vacuum chamber surfaces for electron cloud suppression *Active* 17-May-07

### Kwok Ko, SLAC (kwok@SLAC.Stanford.EDU)

\*2.2.1.E Simulate vacuum chamber and beamline components *Proposed* 10-Aug-06

### Haruyo Koiso, KEK (haruyo.koiso@kek.jp)

\*4.1.1.B Operation of KEKB LER in a low-emittance mode *Proposed* 19-Sep-06

### Anatoly Krasnykh, SLAC (krasnykh@slac.stanford.edu)

\*3.5.1.G Development of DSRD-based fast high-power pulser *Active* 18-Aug-06

\*3.5.1.H Development of reduced beam impedance kicker structure *Active* 17-May-07

4.2.1.A ATF kicker development *Active* 17-Aug-07

### Kiyoshi Kubo, KEK (kiyoshi.kubo@kek.jp)

4.1.1.A ATF beam dynamics and instrumentation studies *Active* 11-Aug-06

### Brett Kuekan, SLAC (kuekan@SLAC.Stanford.EDU)

2.2.3.G Studies of clearing electrodes for suppressing electron cloud build-up *Proposed* 17-May-07

## ILC Damping Rings Researchers' Activities

17-Aug-07

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### Masao Kuriki, KEK ([masao.kuriki@kek.jp](mailto:masao.kuriki@kek.jp))

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Nadine Kurita, SLAC ([kurita@slac.stanford.edu](mailto:kurita@slac.stanford.edu))

2.2.3.F Electron cloud lab measurements and PEP-II studies *Active* 17-May-07

### Ray Larsen, SLAC ([larsen@slac.stanford.edu](mailto:larsen@slac.stanford.edu))

\*3.3.8.A Damping ring power system design *Proposed* 18-May-07

\*3.5.1.A Development of high-availability injection/extraction kicker (SLAC/LLNL) *Active* 17-May-07

3.5.1.B Development of high-availability injection/extraction kicker (SLAC/KEK) *Active* 18-Aug-06

### Robert Lill, ANL ([rlill@aps.anl.gov](mailto:rlill@aps.anl.gov))

\*3.7.2.B Single-pass, high-resolution RF BPM *Proposed* 11-Aug-06

### Alex Lumpkin, ANL ([lumpkin@aps.anl.gov](mailto:lumpkin@aps.anl.gov))

3.7.3.A Development of time-resolved photon diagnostics *Proposed* 12-May-07

### Bob Macek, LANL ([macek@lanl.gov](mailto:macek@lanl.gov))

2.2.3.F Electron cloud lab measurements and PEP-II studies *Active* 17-May-07

### Oleg Malyshev, ASTeC ([o.b.malyshev@dl.ac.uk](mailto:o.b.malyshev@dl.ac.uk))

2.2.3.N Benchmarking of electron-cloud build-up simulations *Active* 20-Sep-06

2.2.3.O Improvement of electron-cloud simulation codes *Active* 20-Sep-06

2.2.3.P Predict electron-cloud effect in the damping rings *Active* 20-Sep-06

2.2.3.Q Experimental determination of surface parameters for electron-cloud build-up *Active* 20-Sep-06

\*3.1.1.B Damping rings vacuum studies *Active* 17-May-07

3.1.1.E Vacuum design of damping rings *Active* 20-Sep-06

\*3.1.1.F Arcs vacuum system technical design *Active* 17-May-07

### Fabio Marcellini, INFN-LNF ([fabio.marcellini@lnf.infn.it](mailto:fabio.marcellini@lnf.infn.it))

3.5.1.E Development of stripline electrodes for fast kickers *Proposed* 10-Aug-06

\*3.5.1.F Laboratory test of FID fast high-power pulser *Active* 10-Aug-06

### Aleksandar Markovik, Rostock ([aleksandar.markovik@uni-rostock.de](mailto:aleksandar.markovik@uni-rostock.de))

2.2.3.C Model electron-cloud build-up and instabilities *Proposed* 12-May-07

### Steve Marks, LBNL ([s\\_marks@lbl.gov](mailto:s_marks@lbl.gov))

3.1.1.A Damping rings wiggler and straights vacuum system design *Active* 17-Aug-07

3.13.1.A Mechanical systems design and integration *Active* 17-Aug-07

### Mika Masuzawa, KEK ([mika.masuzawa@kek.jp](mailto:mika.masuzawa@kek.jp))

4.1.1.C Effects of wiggler *Proposed* 19-Sep-06

### Thomas Mattison, UBC ([mattison@slac.stanford.edu](mailto:mattison@slac.stanford.edu))

\*3.5.1.I Saturating ferrite pulse-sharpener for damping ring kickers *Proposed* 18-May-07

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Justin May, SLAC (jemay@slac.stanford.edu)

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Bob Meller, Cornell (rem@lepp.cornell.edu)

3.5.1.C Development of fast injection/extraction kickers *Active* 17-May-07

4.2.1.E ATF instrumentation and hardware development *Active* 17-May-07

### Kai Meng Hock, Liverpool/CI (k.meng\_hock@dl.ac.uk)

2.2.2.A Impedance-driven coupled-bunch instabilities *Active* 17-May-07

2.2.5.D Characterize injection/extraction transients *Active* 17-May-07

### Leo Michelotti, FNAL (michelotti@fnal.gov)

2.2.5.B Self-consistent modeling of space-charge effects *Proposed* 11-Aug-06

2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### Akio Morita, KEK (akio.morita@kek.jp)

4.1.1.B Operation of KEKB LER in a low-emittance mode *Proposed* 19-Sep-06

### Takashi Naito, KEK (Takashi.Naito@kek.jp)

2.2.4.H Measure fast ion instability in KEK-ATF *Active* 12-May-07

2.2.5.K CSR studies at KEK-ATF *Active* 11-Aug-06

3.5.1.B Development of high-availability injection/extraction kicker (SLAC/KEK) *Active* 18-Aug-06

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

\*4.2.1.B Development of fast rise/fall time kicker for ATF/ATF2 *Active* 11-Aug-06

### Janice Nelson, SLAC (jnelson@slac.stanford.edu)

4.1.1.A ATF beam dynamics and instrumentation studies *Active* 11-Aug-06

### King Ng, FNAL (ng@fnal.gov)

2.2.5.B Self-consistent modeling of space-charge effects *Proposed* 11-Aug-06

2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### Alexander Novokhatski, SLAC (novo@SLAC.Stanford.EDU)

2.2.1.A Develop an impedance budget and specify feedback systems *Active* 17-May-07

2.2.1.D Calculate impedance of vacuum chamber components *Proposed* 17-May-07

2.2.3.G Studies of clearing electrodes for suppressing electron cloud build-up *Proposed* 17-May-07

2.2.5.E Characterize classical single- and multi-bunch instabilities *Active* 17-May-07

3.1.1.C Coordinate design of damping ring vacuum system and control the impedance budget *Proposed* 17-May-07

### Kazuhito Ohmi, KEK (ohmi@post.kek.jp)

\*2.2.3.E Model electron cloud build-up and instabilities *Active* 28-Apr-06

2.2.3.M Measurement of electron cloud instabilities *Proposed* 19-Sep-06

\*2.2.4.C Studies of fast ion instability *Active* 28-Apr-06

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Yukiyoshi Ohnishi, KEK (yukiyoshi.onishi@kek.jp)

2.1.2.B Dynamic aperture studies *Proposed* 17-May-07

### Hasan Padamsee, Cornell (hsp3@cornell.edu)

\* 3.6.2.A Development of 650 MHz superconducting RF cavity and cryomodule *Proposed* 11-Aug-06

### Mark Palmer, Cornell (map36@cornell.edu)

\* 2.1.4.B Develop low-emittance tuning strategies with validation in CesrTA *Active* 17-May-07

\* 2.1.4.C Specify the alignment tolerances and stabilization requirements for the damping rings *Active* 17-May-07

2.2.3.D Studies of electron-cloud build-up and instabilities with simulation and experiment *Proposed* 17-May-07

2.2.4.E Studies of fast ion instability (modelling and experimental) *Active* 17-May-07

\* 2.2.5.H Simulation of the Touschek lifetime and intrabeam scattering effects with measurements in CesrTA *Active* 17-May-07

\* 3.4.6.A Develop physics design for damping wigglers *Inactive* 12-May-07

\* 3.4.6.C Develop engineering design for ILC damping wigglers based on CESR-c superconducting wiggler design *Proposed* 17-May-07

\* 3.5.1.C Development of fast injection/extraction kickers *Active* 17-May-07

3.6.2.A Development of 650 MHz superconducting RF cavity and cryomodule *Proposed* 11-Aug-06

3.7.3.B Develop instrumentation for monitoring emittance damping (including testing and operation in CESR-c and CesrTA) *Active* 17-May-07

\* 4.2.1.D Development of CesrTA *Proposed* 11-Aug-06

### Kosmas Panagiotidis, Liverpool/CI (k.panagiotidis@liverpool.ac.uk)

2.1.4.A Low-emittance tuning techniques and requirements *Active* 17-May-07

### Gregg Penn, LBNL (gepenn@lbl.gov)

2.1.2.A Characterize baseline damping rings dynamic aperture *Active* 17-Aug-07

2.1.4.D Low emittance tuning *Proposed* 17-Aug-07

\* 2.2.2.C Characterize the effects of transients during the injection/extraction process on the damped bunches *Active* 17-Aug-07

### Mauro Pivi, SLAC (mpivi@slac.stanford.edu)

\* 2.2.3.B Model electron-cloud build-up and instabilities *Active* 17-May-07

\* 2.2.3.F Electron cloud lab measurements and PEP-II studies *Active* 17-May-07

\* 2.2.3.G Studies of clearing electrodes for suppressing electron cloud build-up *Proposed* 17-May-07

2.2.3.I CesrTA wiggler and electron cloud studies *Proposed* 17-May-07

\* 2.2.3.K Studies of grooved vacuum chamber surfaces for electron cloud suppression *Active* 17-May-07

**Dave Plate, LBNL (dwplate@lbl.gov)**

- 3.1.1.A Damping rings wiggler and straights vacuum system design *Active* 17-Aug-07
- 3.13.1.A Mechanical systems design and integration *Active* 17-Aug-07

**Gisela Poplau, Rostock (gisela.poeplau@etechnik.uni-rostock.de)**

- 2.2.3.C Model electron-cloud build-up and instabilities *Proposed* 12-May-07

**Miro Preger, INFN-LNF (Miro.Preger@Inf.infn.it)**

- 2.1.2.C Study of beam dynamics with wigglers *Proposed* 10-Aug-06

**Pantaleo Raimondi, INFN-LNF (Pantaleo.Raimondi@Inf.infn.it)**

- 2.2.3.G Studies of clearing electrodes for suppressing electron cloud build-up *Proposed* 17-May-07

**Alessandro Ratti, LBNL (aratti@lbl.gov)**

- 3.7.5.B Development of betatron tune monitor and coherent signal receiver *Proposed* 17-May-07
- 3.8.1.B Characterize injection noise *Proposed* 10-Aug-06

**Tor Raubenheimer, SLAC (tor@slac.stanford.edu)**

- 2.2.3.F Electron cloud lab measurements and PEP-II studies *Active* 17-May-07
- 2.2.3.K Studies of grooved vacuum chamber surfaces for electron cloud suppression *Active* 17-May-07
- \*4.2.1.F ATF multibunch feedback *Active* 25-May-07

**Ina Reichel, LBNL (ireichel@lbl.gov)**

- \*2.1.1.A Injection and Extraction Beam Line Design and Characterisation *Active* 17-Aug-07
- 2.1.2.A Characterize baseline damping rings dynamic aperture *Active* 17-Aug-07

**Ron Reid, ASTeC (r.j.reid@dl.ac.uk)**

- 2.2.3.N Benchmarking of electron-cloud build-up simulations *Active* 20-Sep-06
- 2.2.3.O Improvement of electron-cloud simulation codes *Active* 20-Sep-06
- 2.2.3.P Predict electron-cloud effect in the damping rings *Active* 20-Sep-06
- 2.2.3.Q Experimental determination of surface parameters for electron-cloud build-up *Active* 20-Sep-06
- 3.1.1.E Vacuum design of damping rings *Active* 20-Sep-06

**David Rice, Cornell (dhr1@cornell.edu)**

- 2.2.3.D Studies of electron-cloud build-up and instabilities with simulation and experiment *Proposed* 17-May-07
- 2.2.4.E Studies of fast ion instability (modelling and experimental) *Active* 17-May-07
- 3.4.6.C Develop engineering design for ILC damping wigglers based on CESR-c superconducting wiggler design *Proposed* 17-May-07

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Marc Ross, FNAL (mcrec@slac.stanford.edu)

|           |  |                 |           |
|-----------|--|-----------------|-----------|
| * 3.3.8.B | Damping ring power system design   | <i>Proposed</i> | 18-May-07 |
| 3.5.1.A   | Development of high-availability injection/extraction kicker (SLAC/LLNL) | <i>Active</i>   | 17-May-07 |
| * 3.5.1.B | Development of high-availability injection/extraction kicker (SLAC/KEK)  | <i>Active</i>   | 18-Aug-06 |
| * 3.7.2.A | KEK-ATF BPM electronics  | <i>Active</i>   | 17-May-07 |
| * 4.1.1.A | ATF beam dynamics and instrumentation studies                            | <i>Active</i>   | 11-Aug-06 |

### David Rubin, Cornell (dlr@cesr10.lns.cornell.edu)

|           |   |                 |           |
|-----------|---|-----------------|-----------|
| * 2.1.1.H | Modelling of alternative injection/extraction techniques - RF deflection schemes and other techniques | <i>Proposed</i> | 17-May-07 |
| 2.1.4.B   | Develop low-emittance tuning strategies with validation in CesrTA                                     | <i>Active</i>   | 17-May-07 |
| 4.2.1.D   | Development of CesrTA   | <i>Proposed</i> | 11-Aug-06 |

### David Sagan, Cornell (dcs16@cornell.edu)

|           |  |               |           |
|-----------|--|---------------|-----------|
| * 2.2.5.G | Estimate the impact from CSR   | <i>Active</i> | 12-May-07 |
| 2.2.5.H   | Simulation of the Touschek lifetime and intrabeam scattering effects with measurements in CesrTA | <i>Active</i> | 17-May-07 |

### Vadim Sajaev, ANL (sajaev@aps.anl.gov)

|         |   |                 |           |
|---------|---|-----------------|-----------|
| 2.1.3.B | Orbit and coupling correction and tuning studies  | <i>Proposed</i> | 17-May-07 |
| 2.3.1.A | Integrated modeling of damping ring beam dynamics | <i>Proposed</i> | 11-Aug-06 |

### Ross Schlueter, LBNL (RDSchlueter@lbl.gov)

|            |  |                 |           |
|------------|--|-----------------|-----------|
| * 3.1.1.A  | Damping rings wiggler and straights vacuum system design | <i>Active</i>   | 17-Aug-07 |
| * 3.3.3.A  | Damping ring magnet design                               | <i>Proposed</i> | 18-May-07 |
| * 3.13.1.A | Mechanical systems design and integration                | <i>Active</i>   | 17-Aug-07 |

### Daniel Schulte, CERN (Daniel.Schulte@cern.ch)

|         |   |                  |           |
|---------|---|------------------|-----------|
| 2.2.3.R | Develop a PIC code for computing electron cloud and ion effects | <i>Active</i>    | 20-Sep-06 |
| 2.2.4.I | Characterize ion effects in the damping rings                   | <i>Completed</i> | 20-Sep-06 |

### John Seeman, SLAC (seeman@slac.stanford.edu)

|         |  |               |           |
|---------|--|---------------|-----------|
| 2.2.3.F | Electron cloud lab measurements and PEP-II studies | <i>Active</i> | 17-May-07 |
|---------|--|---------------|-----------|

### Cao Jian She, IHEP ()

|           |                               |                 |           |
|-----------|-------------------------------|-----------------|-----------|
| * 3.7.2.C | Damping rings instrumentation | <i>Proposed</i> | 11-Aug-06 |
|-----------|-------------------------------|-----------------|-----------|

### Kyo Shibata, KEK (kyo.shibata@kek.jp)

|         |   |                 |           |
|---------|---|-----------------|-----------|
| 2.2.3.L | Experiments on suppression of electron cloud effect | <i>Proposed</i> | 19-Sep-06 |
|---------|---|-----------------|-----------|

### Eric Smith, Cornell (ensmith@ccmr.cornell.edu)

|         |  |                 |           |
|---------|--|-----------------|-----------|
| 3.4.6.C | Develop engineering design for ILC damping wigglers based on CESR-c superconducting wiggler design | <i>Proposed</i> | 17-May-07 |
|---------|--|-----------------|-----------|

## ILC Damping Rings Researchers' Activities

17-Aug-07

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### Steve Smith, SLAC (ssmith@slac.stanford.edu)

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Tonee Smith, SLAC (tonee@slac.stanford.edu)

3.7.2.A KEK-ATF BPM electronics *Active* 17-May-07

### Panagiotis Spentzouris, FNAL (spentz@fnal.gov)

\*2.2.3.T Model electron cloud dynamics including modelling for CesrTA *Proposed* 18-May-07

\*2.2.5.B Self-consistent modeling of space-charge effects *Proposed* 11-Aug-06

\*2.2.5.C Self-consistent modeling of CSR effects *Proposed* 12-Apr-06

2.3.1.A Integrated modeling of damping ring beam dynamics *Proposed* 11-Aug-06

### Charles Strohman, Cornell (crs5@cornell.edu)

3.7.3.B Develop instrumentation for monitoring emittance damping (including testing and operation in CESR-c and CesrTA) *Active* 17-May-07

### Gennady Stupakov, SLAC (stupakov@slac.stanford.edu)

2.2.1.D Calculate impedance of vacuum chamber components *Proposed* 17-May-07

### Yusuke Suetsugu, KEK (yusuke.suetsugu@kek.jp)

\*2.2.3.L Experiments on suppression of electron cloud effect *Proposed* 19-Sep-06

### Yi Peng Sun, IHEP (ypsun@mail.ihep.ac.cn)

\*2.1.1.F Damping rings optics design *Inactive* 12-May-07

2.2.1.C Characterize single-bunch collective effects *Proposed* 11-Aug-06

### Eugene Tanke, Cornell (tanke@mail.lepp.cornell.edu)

2.2.3.D Studies of electron-cloud build-up and instabilities with simulation and experiment *Proposed* 17-May-07

2.2.4.E Studies of fast ion instability (modelling and experimental) *Active* 17-May-07

3.7.3.B Develop instrumentation for monitoring emittance damping (including testing and operation in CESR-c and CesrTA) *Active* 17-May-07

### Masaki Tejima, KEK (masaki.tejima@kek.jp)

3.8.1.E Bunch-by-bunch feedback systems and related diagnostics systems *Proposed* 19-Sep-06

## Nobuhiro Terunuma, KEK (nobuhiro.terunuma@kek.jp)

|         |   |        |           |
|---------|---|--------|-----------|
| 2.2.4.H | Measure fast ion instability in KEK-ATF                                 | Active | 12-May-07 |
| 2.2.5.K | CSR studies at KEK-ATF  | Active | 11-Aug-06 |
| 3.5.1.B | Development of high-availability injection/extraction kicker (SLAC/KEK) | Active | 18-Aug-06 |
| 3.7.2.A | KEK-ATF BPM electronics   | Active | 17-May-07 |
| 4.1.1.A | ATF beam dynamics and instrumentation studies                           | Active | 11-Aug-06 |
| 4.2.1.B | Development of fast rise/fall time kicker for ATF/ATF2                  | Active | 11-Aug-06 |

## Maury Tigner, Cornell (mt52@cornell.edu)

|         |   |        |           |
|---------|---|--------|-----------|
| 2.1.4.C | Specify the alignment tolerances and stabilization requirements for the damping rings           | Active | 17-May-07 |
| 2.2.5.H | Simulation of the Touschek lifetime and intrabeam scattering effects with measurements in CsrTA | Active | 17-May-07 |

## Makoto Tobiya, KEK (makoto.tobiya@kek.jp)

|          |   |          |           |
|----------|---|----------|-----------|
| *3.8.1.E | Bunch-by-bunch feedback systems and related diagnostics systems | Proposed | 19-Sep-06 |
|----------|---|----------|-----------|

## Shi Cai Tu, IHEP ()

|          |                             |          |           |
|----------|-----------------------------|----------|-----------|
| *3.3.2.A | Damping rings magnet design | Proposed | 11-Aug-06 |
|----------|-----------------------------|----------|-----------|

## Junji Urakawa, KEK (junji.urakawa@kek.jp)

|          |   |        |           |
|----------|---|--------|-----------|
| *2.2.4.H | Measure fast ion instability in KEK-ATF                                 | Active | 12-May-07 |
| 2.2.5.K  | CSR studies at KEK-ATF  | Active | 11-Aug-06 |
| 3.5.1.B  | Development of high-availability injection/extraction kicker (SLAC/KEK) | Active | 18-Aug-06 |
| 4.1.1.A  | ATF beam dynamics and instrumentation studies                           | Active | 11-Aug-06 |
| 4.2.1.B  | Development of fast rise/fall time kicker for ATF/ATF2                  | Active | 11-Aug-06 |

## Jeremy Urban, Cornell (jtu2@cornell.edu)

|         |   |          |           |
|---------|---|----------|-----------|
| 3.4.6.A | Develop physics design for damping wigglers | Inactive | 12-May-07 |
|---------|---|----------|-----------|

## Cristina Vaccarezza, INFN-LNF (Cristina.Vaccarezza@lnf.infn.it)

|         |  |          |           |
|---------|--|----------|-----------|
| 2.2.3.F | Electron cloud lab measurements and PEP-II studies                           | Active   | 17-May-07 |
| 2.2.3.H | Electron cloud studies in DAFNE  | Proposed | 10-Aug-06 |
| 2.2.3.N | Benchmarking of electron-cloud build-up simulations                          | Active   | 20-Sep-06 |
| 2.2.3.O | Improvement of electron-cloud simulation codes                               | Active   | 20-Sep-06 |
| 2.2.3.P | Predict electron-cloud effect in the damping rings                           | Active   | 20-Sep-06 |
| 2.2.3.Q | Experimental determination of surface parameters for electron-cloud build-up | Active   | 20-Sep-06 |
| 3.1.1.E | Vacuum design of damping rings   | Active   | 20-Sep-06 |

## Ursula van Rienen, Rostock (ursula.van-rienen@uni-rostock.de)

|         |   |          |           |
|---------|---|----------|-----------|
| 2.2.3.C | Model electron-cloud build-up and instabilities | Proposed | 12-May-07 |
|---------|---|----------|-----------|

## ILC Damping Rings Researchers' Activities

17-Aug-07

### Marco Venturini, LBNL (MVenturini@lbl.gov)

|          |  |                 |                  |
|----------|--|-----------------|------------------|
| 2.2.3.A  | Model electron cloud instability                             | <i>Active</i>   | <i>17-Aug-07</i> |
| 2.2.3.I  | CesrTA wiggler and electron cloud studies                    | <i>Proposed</i> | <i>17-May-07</i> |
| 2.2.4.A  | Experimental studies of fast ion instability at the LBNL-ALS | <i>Active</i>   | <i>17-Aug-07</i> |
| *2.2.5.A | Characterize selected single-bunch instabilities             | <i>Active</i>   | <i>17-Aug-07</i> |

### Lanfa Wang, SLAC (wanglf@slac.stanford.edu)

|          |   |                 |                  |
|----------|---|-----------------|------------------|
| 2.2.3.B  | Model electron-cloud build-up and instabilities                           | <i>Active</i>   | <i>17-May-07</i> |
| 2.2.3.F  | Electron cloud lab measurements and PEP-II studies                        | <i>Active</i>   | <i>17-May-07</i> |
| 2.2.3.G  | Studies of clearing electrodes for suppressing electron cloud build-up    | <i>Proposed</i> | <i>17-May-07</i> |
| 2.2.3.I  | CesrTA wiggler and electron cloud studies                                 | <i>Proposed</i> | <i>17-May-07</i> |
| 2.2.3.K  | Studies of grooved vacuum chamber surfaces for electron cloud suppression | <i>Active</i>   | <i>17-May-07</i> |
| *2.2.4.B | Numerical and analytical studies of two-stream (beam-ion) instabilities   | <i>Active</i>   | <i>17-May-07</i> |
| *2.2.4.F | Studies of suppression techniques for fast ion instability                | <i>Active</i>   | <i>17-May-07</i> |
| *2.2.4.G | Experimental studies of fast ion instability                              | <i>Proposed</i> | <i>12-May-07</i> |

### Rainer Wanzenberg, DESY (rainer.wanzenberg@desy.de)

|          |  |                 |                  |
|----------|--|-----------------|------------------|
| *2.2.3.C | Model electron-cloud build-up and instabilities                              | <i>Proposed</i> | <i>12-May-07</i> |
| 2.2.3.N  | Benchmarking of electron-cloud build-up simulations                          | <i>Active</i>   | <i>20-Sep-06</i> |
| 2.2.3.O  | Improvement of electron-cloud simulation codes                               | <i>Active</i>   | <i>20-Sep-06</i> |
| 2.2.3.P  | Predict electron-cloud effect in the damping rings                           | <i>Active</i>   | <i>20-Sep-06</i> |
| 2.2.3.Q  | Experimental determination of surface parameters for electron-cloud build-up | <i>Active</i>   | <i>20-Sep-06</i> |
| 3.1.1.E  | Vacuum design of damping rings   | <i>Active</i>   | <i>20-Sep-06</i> |

### Glen White, SLAC (whitegr@slac.stanford.edu)

|         |   |               |                  |
|---------|---|---------------|------------------|
| 4.1.1.A | ATF beam dynamics and instrumentation studies | <i>Active</i> | <i>11-Aug-06</i> |
|---------|---|---------------|------------------|

### Russell Wilcox, LBNL (RBWilcox@lbl.gov)

|         |                              |                 |                  |
|---------|------------------------------|-----------------|------------------|
| 3.6.4.A | Develop low-level RF systems | <i>Proposed</i> | <i>17-May-07</i> |
|---------|------------------------------|-----------------|------------------|

### Ferdinand Willeke, DESY (ferdinand.willeke@desy.de)

|          |                        |                 |                  |
|----------|------------------------|-----------------|------------------|
| *4.2.1.C | Development of HERA-DR | <i>Proposed</i> | <i>11-Aug-06</i> |
|----------|------------------------|-----------------|------------------|

**Andy Wolski, Liverpool/CI (a.wolski@dl.ac.uk)**

|           |   |                 |                  |
|-----------|---|-----------------|------------------|
| * 2.1.4.A | Low-emittance tuning techniques and requirements                                  | <i>Active</i>   | <i>17-May-07</i> |
| * 2.2.1.B | Develop single-bunch impedance models and characterize instabilities              | <i>Proposed</i> | <i>17-May-07</i> |
| * 2.2.2.A | Impedance-driven coupled-bunch instabilities                                      | <i>Active</i>   | <i>17-May-07</i> |
| 2.2.3.F   | Electron cloud lab measurements and PEP-II studies                                | <i>Active</i>   | <i>17-May-07</i> |
| * 2.2.5.D | Characterize injection/extraction transients                                      | <i>Active</i>   | <i>17-May-07</i> |
| * 2.2.5.I | Estimate impact of intrabeam scattering on extracted (non-equilibrium) emittances | <i>Proposed</i> | <i>11-Aug-06</i> |
| 2.2.5.J   | Study of CSR effects at KEK-ATF   | <i>Proposed</i> | <i>17-May-07</i> |

**Mark Woodley, SLAC (mdw@slac.stanford.edu)**

|         |   |               |                  |
|---------|---|---------------|------------------|
| 4.1.1.A | ATF beam dynamics and instrumentation studies | <i>Active</i> | <i>11-Aug-06</i> |
|---------|---|---------------|------------------|

**Guoxing Xia, DESY (guoxing.xia@desy.de)**

|           |                                 |               |                  |
|-----------|---------------------------------|---------------|------------------|
| * 2.2.4.D | Studies of fast ion instability | <i>Active</i> | <i>11-Aug-06</i> |
|-----------|---------------------------------|---------------|------------------|

**Aimin Xiao, ANL (xiaoam@aps.anl.gov)**

|         |   |                 |                  |
|---------|---|-----------------|------------------|
| 2.1.1.C | Damping ring lattice design and optimization      | <i>Active</i>   | <i>17-May-07</i> |
| 2.1.1.G | Alternative ring designs                          | <i>Proposed</i> | <i>11-Aug-06</i> |
| 2.1.3.B | Orbit and coupling correction and tuning studies  | <i>Proposed</i> | <i>17-May-07</i> |
| 2.3.1.A | Integrated modeling of damping ring beam dynamics | <i>Proposed</i> | <i>11-Aug-06</i> |

**Bingxin Yang, ANL (bxyang@aps.anl.gov)**

|           |   |                 |                  |
|-----------|---|-----------------|------------------|
| * 3.7.3.A | Development of time-resolved photon diagnostics | <i>Proposed</i> | <i>12-May-07</i> |
|-----------|---|-----------------|------------------|

**Dong Hai Yi, IHEP ()**

|           |                        |                 |                  |
|-----------|------------------------|-----------------|------------------|
| * 3.1.1.D | Vacuum chamber studies | <i>Proposed</i> | <i>11-Aug-06</i> |
|-----------|------------------------|-----------------|------------------|

**Frank Zimmermann, CERN (Frank.Zimmermann@cern.ch)**

|           |  |                  |                  |
|-----------|--|------------------|------------------|
| * 2.2.3.N | Benchmarking of electron-cloud build-up simulations                          | <i>Active</i>    | <i>20-Sep-06</i> |
| * 2.2.3.O | Improvement of electron-cloud simulation codes                               | <i>Active</i>    | <i>20-Sep-06</i> |
| * 2.2.3.P | Predict electron-cloud effect in the damping rings                           | <i>Active</i>    | <i>20-Sep-06</i> |
| * 2.2.3.Q | Experimental determination of surface parameters for electron-cloud build-up | <i>Active</i>    | <i>20-Sep-06</i> |
| 2.2.3.R   | Develop a PIC code for computing electron cloud and ion effects              | <i>Active</i>    | <i>20-Sep-06</i> |
| * 2.2.4.I | Characterize ion effects in the damping rings                                | <i>Completed</i> | <i>20-Sep-06</i> |
| * 3.1.1.E | Vacuum design of damping rings   | <i>Active</i>    | <i>20-Sep-06</i> |

## ILC Damping Rings Researchers' Activities

17-Aug-07

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### Michael Zisman, LBNL (mszisman@lbl.gov)

|          |  |                 |                  |
|----------|--|-----------------|------------------|
| 2.1.1.A  | Injection and Extraction Beam Line Design and Characterisation                                       | <i>Active</i>   | <i>17-Aug-07</i> |
| *2.1.2.A | Characterize baseline damping rings dynamic aperture   | <i>Active</i>   | <i>17-Aug-07</i> |
| *2.1.4.D | Low emittance tuning   | <i>Proposed</i> | <i>17-Aug-07</i> |
| 2.2.2.C  | Characterize the effects of transients during the injection/extraction process on the damped bunches | <i>Active</i>   | <i>17-Aug-07</i> |
| 2.2.3.I  | CesrTA wiggler and electron cloud studies  | <i>Proposed</i> | <i>17-May-07</i> |
| 2.2.4.A  | Experimental studies of fast ion instability at the LBNL-ALS   | <i>Active</i>   | <i>17-Aug-07</i> |
| 2.2.5.A  | Characterize selected single-bunch instabilities   | <i>Active</i>   | <i>17-Aug-07</i> |