

Geneva, November 3, 2001

Mini-Workshop on Electron-Cloud Simulations for Proton and Positron Beams at CERN, Geneva, April 15-18, 2002

<http://wwwslap.cern.ch/collective/ecloud02>

First Announcement and Call for Abstracts:

Beam induced multipacting, instabilities, and beam blow up driven by an electron cloud are observed with the LHC proton beam in the SPS, in the PS, at PEP-II and KEKB. The impact on beam diagnostics, and, for LHC, the heat load on the cold bore are further concerns. For future linear colliders or proton drivers, the density of the electron cloud may be 10-100 times higher than in the existing storage rings. Related informations can be found at the CERN electron-cloud web page (<http://wwwslap.cern.ch/collective/electron-cloud>), at the Argonne electron-cloud web page (http://www.aps.anl.gov/asd/physics/ecloud/papers_top.html), and at the web page of the recent International Workshop on Two-Stream Instabilities, Tsukuba, September 2001 (<http://conference.kek.jp/two-stream>).

The electron cloud induces betatron tune shifts, tune spread, and transverse single and multi-bunch instabilities. Various theoretical and simulational approaches have addressed these possibilities. The predictions are not always consistent.. Also a variety of simulation codes have been developed, using different approximations and including different physics. Longitudinal effects and plasma phenomena have not yet been included in most of the analyses or simulations. Another unsolved question is the possibility of a 'magnetron effect'.

The CERN mini-workshop on Electron-Cloud Simulations for Proton and Positron Beams will review the present analytical, simulation and modelling approaches to the electron-cloud problem, confront them with beam observations, and provide a direction for future studies. The emphasis of the workshop is on simulation recipes and physics content. In particular, the following *issues* will be discussed:

- Simulations of electron cloud build up, decay time, minimum size of clearing gap
- Effective transverse and longitudinal wake fields induced by the cloud
- Simulations and analytical treatments of transverse instabilities driven by the cloud
- Coherent tune shift and incoherent tune spread
- Simulation of potential remedies
- Plasma approaches to the electron-beam interaction
- Synergies between electron cloud, regular impedance, space charge and/or beam-beam interaction.

The following *goals* should guide the workshop:

- Benchmark simulation results against beam observations and against each other.
- Determine which simulation approaches best represent reality.
- Document the present understanding and determine the important open questions.
- Develop a program for future research and development.
- Strengthen and expand international collaborations for this work.

The workshop will be held on April 15-18, 2002, at the European Organization for Nuclear Research, CERN, in Geneva, Switzerland.

There will be no registration fee. CERN will publish the proceedings. In addition, we recommend submission of the workshop contributions to Physical Review Special Topics – Accelerators and Beams, to be published in a special edition.

Abstracts, related to electron-cloud observations, modelling or simulations, should be submitted preferably via the E-CLOUD'02 WWW page, or by email to the members of the local organizing committee Giovanni Rumolo (giovanni.rumolo@cern.ch) or Frank Zimmermann (frankzimmermann@cern.ch). The deadline for the receipt of **abstracts** is **January 31, 2002**.

A block of rooms has been reserved for workshop participants at the CERN hostel in Meyrin close to the workshop site until January 31. We encourage participants to make reservations via the web site <http://cern.web.cern.ch/CERN/housing/hotel/Hostel.html> , and to inform the workshop organizers.

A workshop banquet will be organized on a voluntary basis.

By the end of the year we will send out a second announcement with the tentative programme.

Giovanni Rumolo, Francesco Ruggiero, Juliette Thomashausen, Frank Zimmermann

Tentative Programme (Monday, April 15 – Thursday, April 18, 2002)

Monday	morning	experimental observations on existing accelerators, concerns for future machines
	afternoon	laboratory measurements and modelling (photoemission, ionization, secondary emission)
Tuesday	morning	simulations of electron-cloud build up (incl. surface scrubbing, heat load, effect of magnetic fields)
	afternoon	simulations of electron-cloud instabilities (single and multi bunch)
Wednesday	morning	specific comparisons and plasma approaches
	afternoon	discussion of future studies, collaborations, and pending issues
Thursday	morning	summary talks

International Programme Committee

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W. Chou, FNAL
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J. Seeman, SLAC
J. Wei, BNL
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Local Organizing Committee

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