Summary of Saturday (9 Oct 2010) afternoon session, ECloud 2010

Bob Zwaska and Kiran Sonnad
List of talks

- Overview of CesrTA R&D program – David Rubin (Cornell).
- E-Cloud activity of DLC and TiN Coated Chambers at KEKB Positron Ring – Shigeki Kato (KEK).
- Ecloud mitigations Investigations at CesrTA – Joseph Calvey (Cornell)
- Versatile Device for In-Situ Multiple Coatings of Long, Small Diameter Tubes – Ady Hershcovitch (BNL)
- Exprimental efforts at LNF to reduce SEY in particle accelerators – Roberto Cimino (LNF-INFN)
Overview of CesrTA R&D program

Speaker David Rubin

- Low emittance tuning < 20 pm
- Potential of more collaborations with other groups – in addition what exists now.
- Shielded pick up/time resolved measurements of Ecloud at CestTA
  - Poster by John Sikora on the same subject
  - High-bandwidth Faraday Cup
  - One can look at of bunch by bunch cloud build up and decay.
- Tune shift measurements, Head-Tail sidebands, in situ SEY measurements, TE wave and RFA measurements.
  - Instrumentation in drifts, dipoles, quads, and wigglers
- Coupled bunch and head-tail instabilities observed
- Mitigations
  - Solenoids work well in drifts
  - Coatings works well in drifts, dipoles, and quads
  - Grooves add marginal improvement in dipoles and wigglers
  - Clearing electrodes excel in wigglers
- Look at other talks/posters on CesrTA for details.
E-Cloud activity of DLC and TiN Coated Chambers at KEKB Positron Ring – Shigeki Kato (KEK).

- 2 models for conditioning:
  - Surface gradually converted to graphite
  - Surface entirely cleaned so substrate is bare
  - Is this really all there is to conditioning?

- KEK solution: start with carbon, but make it the right one
  - PCVD-based DLC coating - inexpensive.
  - Easy? Can it be done over extended distances?

- Roughed DLC preparation – question by Mike Billing on resistivity, how does the roughness compare with skin depth?

- Measure data of Pressure, RGA and EC activity at KEK
  - Vacuum behavior not terrible, but may not compare so well with other surfaces

- EC mitigation of the roughed DLC surface seem to be outstanding.
Ecloud mitigations Investigations at CesrTA – Joseph Calvey (Cornell)

- RFA investigation in dipoles – changed fields in chicane.
  - Low profile RFAs allow in-dipole measurement, though response may not be as robust
- NEG requires activation to reduce SEY
  - SEY continues to condition during CHESS run
- Chicane field scans – cyclotron resonances, peaks and dips, some features cannot be explained.
- Wiggler Cu, TiN, grooved – all within a factor of 2
  - Electrode gives ultimate suppression
- TiN in dipoles, grooving provided improvement
  - Both much better than Al
- Obtain further details of Ecloud density through post processing and build up simulations
  - Extensive effort to fit SEY params to data
Versatile Device for In-Situ Multiple Coatings of Long, Small Diameter Tubes – Ady Hershcovitch (BNL)

- Pig to move throughout the ring, coating magnets
  - PVD / magnetron deposition
- Coat 500m!
- Studies on samples of RHIC cold bore tubes.
  - Initial results are promising
- Need to be able to replace cathodes
- Worry about getting stuck
Experimental efforts at LNF to reduce SEY in particle accelerators – Roberto Cimino (LNF-INFN)

- What energy do the electrons have in particle accelerators – for the sake of conditioning?
  - Don’t want to rely on mysterious commissioning
- How do they compare with that from a gun used to bombard electrons for conditioning studies?
- Experiments involving aiming gun onto RFA to understand electrons generated in the RFAs.
- Study photon conditioning using beamlines + SEY and PEY on the same sample – need to be on the lookout for results.
- Look into graphene or “soot” as alternatives