Weekly 9mA meeting

27 July, 2009

John Carwardine

Agenda

- *Brief update on Fermilab downconverters – Brian Chase*
- Outline of beam studies plan for Sept 7-21 - Nick Walker
- Previously-submitted studies proposals - John Carwardine
- Discussion of LLRF/RF related beam studies and measurements - All
- *RTML 'zero crossing' study discussion*

Previously-submitted proposals

- Demonstrate ATCA-based LLRF system at ACC456 (Koprek)
- Cavity field jitter studies (Pei, Adolphsen)
- RF power overhead with heavy beam loading (Pei, Adolphsen)
- RF zero-crossing stability studies for ILC RTML (Solyak)
- RF absorber (cryoload) studies (Sekutowicz) [Parasitic]

ATCA LLRF demonstration (W. Koprek)

- Important XFEL-related demonstration
- Feedback tests on ACC456 with RF only
- Low Level Applications tests by Z. Geng - 2 shiftIf our test with feedback in ACC456 is successful, we would like to get
- a few hours for tests with beam - measurement of beam stability with ATCA
- system. Maybe end of week 36.
- ~4 shifts in total for exclusive work on ACC456. The
- rest will be done parasitically. We would like to have the shifts at least
- every second day or seldomer. Not every day!

RTML 'zero-crossing' study proposal (N. Solyak)

- Main objective
  - **Study intra-train and pulse-to-pulse amplitude and phase stability in the ACC456 running 90 degree off-crest for long-pulse 9mA operation.**
- Required beam conditions:
  - **500-2400 bunches per pulse: 3nC/bunch at 500kHz-3MHz**
  - **Long RF flat tops (800us)**
  - **Critical measurement: beam energy**
  - **Precise measurements of the beam arrival time (phase) by BAM before and after ACC456 (~40fs or 0.02 degrees)**
  - **ACC456 rep rate of 2.5Hz**
  - **Optics tuned to beam energy after ACC23 (~400 MeV)**

Anticipated study plans

- Characterizing new dump-line diagnostics
- Optics setup and model validation for bypass and dump line
- LLRF high beam loading studies, tuning LLRF system for increases in average current and pulse length
- LLRF gradient studies
- Energy stability with long bunch-trains and heavy beam loading
- Data collection for publication of 9mA results