

Pressure rise and electron cloud study plan, (Draft), 8-12-02

I. Study plan

1. Electron cloud and pressure rise – WF, SY,
Parasitic and dedicated. Electron cloud time structure vs. pressure rise. Electron density and saturation.
2. Solenoid effect – SY, DH,
Parasitic and dedicated. If effective, to study solenoid strength, coverage, etc.
3. Electron cloud vs. beam injection pattern – WF, HH,
Dedicated. Effect of beam injection pattern and intensity on EC and pressure rise. Also look at electron cloud decay time.
4. Beam scrubbing – HH, MMB, SY,
Dedicated. Looking for possible improvement in the EC and pressure rise by scrubbing.
5. Gap cleaning at the injection – AD, UI,
Parasitic and dedicated. The ions out of bucket may help electrons to survive gap. Also to see if the gap cleaning can benefit us.
6. Beam halo scraping and beam loss effect – VP, MB, WF, DT,
Dedicated. Steering beam to look at the beam loss, pressure rise, secondary electrons and ions, and gas composition.
7. RHIC electron cloud and vacuum pressure rise characteristics – PH, DH,
Parasitic and dedicated. Energy distribution of secondary electrons. Gas composition and its evolution along the pressure rise. Also the ions detection.

8. Coherent tune shift along the bunch injection – TS, MB, WF,
Parasitic and dedicated. Look at electron density and distribution.
9. Incoherent tune spread of EC vs. beam-beam, octupole setting, and chromaticity – SY, PC, VP,
Parasitic and dedicated. Look at EC effect on the beam instability. Using HF Schottky?
10. Secondary electron and ion production study using collimator – PT, AD, DT,
Dedicated. Scraping effect of high energy ions.
11. ATR vacuum study by steering the beam – WF, PH, DH,
Dedicated. To help understanding the pressure rise at the long straight sections.
12. Ionization cross section study – SY, DT, MMB, DH,
Parasitic and dedicated. Unprecedented study at the RHIC high energy.

II. Persons in the study

AD(Angelika Drees), DH(Dick Hseuh), DT(Dejan Trbojevic), HH(Haixin Huang), MB(Mei Bai), MMB(Mike Blaskiewicz), PC(Peter Cameron), PH(Ping He), PT (Peter Thieberger), SY(SY Zhang), TS(Todd Satogata), UI(Ubaldo Iriso), VP(Vadim Ptitsyn), WF(Wolfram Fischer),

III. Leading person(s) should

- 1) Write a few lines of study plan, including a) study purpose, parameter, and procedure, b) instrumentation, control, and software requirement.
- 2) Collect study data, organize discussion, and write progress report and/or conclusion.