

DATE: November 6, 2001

TO: RHIC E-Coolers

FROM: Ady Hershcovitch

SUBJECT: **Minutes of the October 26, 2001 Meeting**

Memo

Present: Michael Harrison, Ady Hershcovitch, Jorg Kewisch, William MacKay, Thomas Roser, Dejan Trbojevic, Dong Wang, Jie Wei.

Topics discussed: Funding, Magnets, RF Cavities, Simulation Codes. Meeting Minutes.

Funding: Our strong support for Advanced Energy Systems (AES) quest for SBIR phase II funding was conveyed to DOE.

Magnets: Mike showed a FNL permanent dipole magnet design that has our needed aperture. However, the pole tip field is only 1.4 kG, while Jorg calculated that 1.6 kG is needed. Therefore, the dipole magnet length must be increased to 70 cm (from 60 cm) to compensate for the lower magnetic field. Altogether about 40 dipole and 60 quadrupole magnets are needed. For tuning purpose, electromagnets are needed. A hybrid scheme would adversely affect the permanent magnets. A possible solution is to replace some of the permanent magnets with electromagnets. Jorg calculated that having an electromagnetic block for every four blocks of permanent magnets would work. Since only 1.4 kG field is needed, the electromagnets can be air cooled. Jorg promised to start solenoid design. Mike sent FNL some ion pumps.

RF Cavities: Mike and Thomas opened a discussion regarding cryogenic system requirements for the RF cavities. It takes 4 – 6 hours to cool such cavities. The three cavities, when powered, require 60 W of cooling (i.e., 80 liter/hour) at a temperature of 2.5 K. We still need to know the helium consumption of unpowered cavities. Basically, a helium consumption of about 1000 liters/day is expected. Installing a helium liquefier is too expensive (about \$2M). By comparison, the cost of fully recovered He is \$2/liter. Need to consider a cryo-system based on batch filling. And, an operation mode of long days running for two weeks at a time.

Simulation Codes: Dong and Jorg reported on the status of computations using various codes. MAD has been successfully used for the 54 MeV electron beam. Dong had success using PARMELA for the low energy beam (where space charge effects important). Simulations from the electron gun to the beam dump, with gun and cavities in a straight line, indicate that beam emittance is fine. Merging beam calculation are yet to be done.

Comparison between cooling simulation codes was completed. Some uncertainties remain due lack of a manual for the new code BETACOOOL.

Meeting Minutes: E-mail distribution of "Meeting Minutes" will be in ASCII and in PDF formats; and, posted on <http://www.rhichome.bnl.gov/RHIC/luminosity/upgrade/minutes/> by Waldo. Additional pages of interest are: a general page for luminosity issues in RHIC: <http://www.rhichome.bnl.gov/RHIC/luminosity/> and, a page for upgrade issues: <http://www.rhichome.bnl.gov/RHIC/luminosity/upgrade/>

Correction: Thomas Roser attended the October 12th meeting.