

DATE: January 10, 2003

TO: RHIC E-Coolers

FROM: Ady Hershcovitch

SUBJECT: **Minutes of the January 10, 2003 Meeting**

Memo

Present: Ilan Ben-Zvi, Gregory Citver, Michael Harrison, Ady Hershcovitch, Jorg Kewisch, Derek Lowenstein, William Mackay, Satoshi Ozaki, Thomas Roser, Triveni Srinivasan-Rao, Dejan Trbojevic, Dong Wang, Jie Wei, Qiang Zhao.

Topics discussed: Simulation & Calculations, Measuring Magnetization Evolution, 939 Setup.

Simulation & Calculations: Jorg opened the meeting with a description of computations that he is attempting to perform. Jorg's aim is to optimize magnetized electron beam transport between the gun solenoid and the cooling solenoid by inserting various elements between them. The objective is to computationally bring the transport matrix to unity. Physically this condition corresponds to a case where the beam sizes at the gun solenoid exit and the cooling solenoid entrance are the same. Under those conditions, electron beam emittance in the solenoid is minimized, phase advance is an integer, and the beta function corresponds to the beam size. PARMELA is utilized to obtain particle coordinates. Jorg is presently debugging a new program, which he had written to analyze the PARMELA database.

In answer to Dejan's questions regarding visits by simulation collaborators, Ilan replied that the Dubna collaborators have been unable to obtain visas so far, and that Dave Bruhwiler from TECH-X will give a presentation at our January 31st, 2003 meeting.

Measuring Magnetization Evolution: in an answer to Thomas regarding survival of magnetization, Ilan described the ATF magnetized beam experiment, in which magnetization measurements will be performed. Presently the experiment consists of a RF electron gun and a series of lenses that function as analyzers for phase advance. The beam (and its shape) is monitored at different phase advances with a photographic screen, and its evolution is determined by tomographic technique. An additional solenoid is being built to magnetize the electron beam. Development of radial tomography is in progress. Among others, Dong is collaborating with Feng Zhou in this endeavor.

In answer to Thomas about the difference between the ATF experiment and the FNL one, Ilan replied that the FNL experiment has a flat electron beam. Thomas also asked how does

the space charge level in the ATF experiment compares to the RHIC electron cooling beam. Ilan replied that at this time there is no clear answer. Here each bunch has 1 – 2 nC, but the spot size is smaller. It is not clear if it simulates the RHIC electron cooling beam well.

939 Setup: in answer to Derek's question, Triveni reported on the status the 939 setup. Much progress was made with the mechanical aspects of the cryogenic system. Within the next two weeks, liquid nitrogen tests can be performed. Liquid nitrogen cooling is initially designed to check sensors and measure movement due to mechanical contraction. Dejan asked for details and resolution of the measurements. Triveni replied that the measurements consist of determining the position of a laser beam reflected off a polished blank flange. The resolution is a fraction of one mm. The laser, which had to be sent back to Switzerland, was redelivered. It works well except that its power is 2.5 W instead of 5 W. Triveni said that if the quantum efficiency will be at or above 1% (record is 14%), the reduced laser power will be inconsequential.

Most of the materials and preparations needed for the safety reviews should be completed by the end of January. Tests in the deposition chamber could begin next month and evaporation experiments can start in March. In answer to Satoshi's question on the current magnitude, Triveni answered that the objective is to reach 100 mA and to test for cathode lifetime. Near term objectives are to study outgassing rates from GlidCop and various brazings, the contaminants they generate and their effects on cathode lifetime.