SUMMARY - BEVATRON RESEARCH MEETING I
October 6, 1953
4 PM Bldg. 50 Auditorium

Ed. Lofgren: Bevatron as a Research Instrument

Meeting Dates and Agenda

Meeting of the Research Conference Group will continue to be scheduled on Tuesday afternoons at 4 PM in the Building 50 Auditorium. Mrs. Hirsch (Ex. 424) will post meeting notices on key bulletin boards.

A tentative agenda for future meetings will include:

1.	Owen Chamberlain	Cosmotron
2.	Warren Chupp	Targets in the Bevatron
3.	Wilson Powell	Diffusion Cloud Chambers
4.	Joseph Lepore	High Energy Physics

Bevatron Status (Brief)

1. Physical structure of magnet now assembled and being tested. Initial pulsing to rated field currents indicate that magnet is performing as designed. Currents of the order of 8500 amps peak have already been rendered. (About 15,000 gauss).

2. Pumpdown time to approximately 10^{-5} mm Hg is of the order of 24 hours at present but is expected to improve to 12-15 hours as the high vapor pressure solvents are removed. Lofgren and Brobeck expect that it will be possible to make interval target, etc., changes between operating shifts without excessive loss of experimental time.

3. Injector and linear accelerator are now operating stably. Injected currents to Linac are approximately 3×10^{-3} peak at 450 kev. Linac output is approximately 5% or 70×10^{-6} amps peak with an angular divergence of 10^{-3} rad. and a maximum energy spread of less than 0.8% at 9.8 Mev.

4. Inflector and induction electrodes are to be installed after December 15, 1953.

5. Complete machine, both mechanical and electrical, will be ready for testing and "de-bugging" approximately December 15, 1953. Initial operation as a research instrument should begin after the first of the year, perhaps January 15, 1954 to January 30, 1954.

6. Magnetic testing started October 2 and will continue for approximately 6 weeks (until about November 15).

7. Concrete shielding will be installed around the southwest quadrant of the machine and at the south and west straight sections before research operations begin.

Facilities

1. Neutral particle beams will be provided for initial experiments. These will be available from an internal target in the southwest quadrant. Beams will leave the vacuum liner by way of a 3/64-inch stainless steel window (at approximately 30° incidence) from the west tangent tank.

2. Negative meson beams from 2 Bev up will be available from the west tangent tank shortly after start-up.

3. Concrete shielding on the west tank will be 10 feet thick and provided with a special 2 foot slot. Removable sector blocks of small size will provide several beam channels within the 2 foot slot.

4. An absolute minimum of counting facilities will be available at start-up. Regulated power supply outputs for filament, plate and photo multiplier voltages will be provided. Counting equipment will have to be diverted from other projects, although some new equipment may be designed after the next fiscal year.

5. No special magnets have been designed to date although a preliminary study has been made for a small volume 10^5 gauss unit.

6. Cooling water and high current power will be available for cloud chambers, pair spectrometers, etc., at building columns.

7. Internal targets may be attached to the filler frames via standard boring templates.

8. Air locks (12" x 6") in the straight sections on the median plane will allow insertion of special targets (10-15 lbs maximum). At least one rod will be remotely controlled for pulsing a target into the beam. Fixed probes can be attached to plates in the bellows section adjoining the curve tanks.

Operating Schedule

Because of large financial savings resulting from decreased use of demand power, the Bevatron operation schedule will be from 5 PM to 1 AM. Internal target modifications as well as any work necessitating loss of vacuum will begin at 1 AM so as to have the machine pumped down and ready for research to continue by the following evening.

Expected Beam

Based on Cosmotron operation and the linear accelerator input, Lofgren estimated that the Bevatron beams at turn-on should accelerate approximately 5×10^8 particles per pulse to more than 6 Bev. A factor of 10 increase may be expected when the new high current (30 ma) injector is completed and installed.