PS/AA/BA/ip
April 27, 1982

AA Long Term Note No. 4

Summary of the meeting of March 26, 1982

Storage of Antiprotons in the ISR (C. Rubbia)

Short $\bar{p}$ pulses can be produced at 26 GeV/c with a primary proton beam delivered by the SPS. The target would be located upstream to the West Hall. Bursts of several 10^9 antiprotons would be injected into one ISR ring and reduced in momentum spread by a "bunch rotation" technique. At this stage, two possibilities exist.

1. Each pulse of antiprotons is stored in the second ISR ring and, after some time, the full beam is ejected towards the SPS. The process does not imply any cooling but the luminosity would not increase substantially in the SPS.
2. To gain in luminosity, one solution consists of decelerating the beam to 3.5 GeV/c and transfering it to AA. The overall gain in phase space density would then be a factor 4.

Electron Cooling at High Energy (C. Rubbia)

Electron guns have been developped for free electron lasers using Van de Graaf's accelerator technology. They are capable of producing 3 MeV electrons. With an antiproton beam emittance as small as 1 π mm-mradian, a cooling time of 1 second in Δp can be achieved. The cost of such a gun is 1 million dollars.

SQUID (C Rubbia)

SQUID stands for "Superconducting QUantum Interference Device". These instruments are applied to the detection of very small magnetic fluxes (search of monopoles by Alvarez Group, military application). Their sensitivity is 4.17×10^{-17} Weber. A potential interest for stochastic cooling lies in the detection of low level signals without intrinsic thermal noise.

A AA Long Term Note dealing with these topics will be issued.

Focussing Target Experiment (J.C. Schnuriger)

A laboratory experiment is being prepared to study the technical problems of targets fed by high current pulses. In a copper bar of 3 mm diameter and 100 mm length, a 170 kA current produces a magnetic pressure of 200 bars and a maximum stress of 5×10^8 Newton/m^2, above the tensile strength in copper. The heating due to the Joule effect and the shock of the proton beam raises the temperature near the melting point. The resistivity is thus relatively high and the current is distributed more in the bulk of the rod than in a skin.

In the first tests, the target was tightly mounted in a coaxial case and connected in series with an old horn. After 200 pulses at 170 kA, the target did not show any damage.

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