



QUASI - PERIODICAL INTERNAL NEWSLETTER

August 1968

NEW BEAM ENERGY RECORD

During this two-week accelerator shut-down, many different tasks are being undertaken to upgrade the machine. It was thought that this would be a good time for another SLAC newsletter to bring everyone up-to-date.

Just before the shutdown, a try at a new high energy record was made. At 3:30 p.m., Friday, August 16, we succeeded in achieving 20.58 BeV electrons through the accelerator, an energy higher than ever before. In addition this was achieved with five of the 245 klystrons kept in reserve, not capable of being used at that time, which promises even more energy in the future.

Other Improvements

During this shut-down, "dimpling" modifications of the accelerator sections are beginning, first in Sector 1, which will result in a higher and varied beam break-up threshold to permit larger beam currents. At long last a truly high-fidelity communications system has been installed so that operators in CCR and DAB and physicists in the experimental areas (Counting House, etc.) can all talk to each other. Other upgrading during shut-down includes a major overhaul of half of the drive line, improvements to the beam monitoring system, etc.

Superconducting Accelerator Research

Using near-absolute-zero temperatures to improve accelerator structures is a relatively new idea. SLAC has begun some new research in this infant field. In a very early experiment here we successfully excited a superconducting accelerator cavity in a liquid helium bath. The result was an operating quality factor 1000 times higher than that in our two-mile accelerator cavities.

Millions of Pictures

Our two large bubble chambers have been operating extremely well considering the newness of the installation. The 40-inch bubble chamber has produced over 2,000,000 pictures of events for SLAC physicists and for scientists from the Weizmann Institute in Israel. The 82-inch bubble chamber has produced over 700,000 pictures for experimenters from Harvard, Purdue, and the University of California.

Streamer Experiments Augmented

A majority of pictures taken in a streamer or bubble chamber are not useable because particles without electric charge are not detected. This has been solved here at our streamer spark chamber by using what is called a "High-Z Spark Chamber" as an auxiliary. This added device provides the missing data needed to greatly increase the number of meaningful events photographable in the streamer chamber.

This is the thirteenth issue of what appears every once in a while from the Technical Information Office whenever developments at SLAC warrant. The material herein is for your information and not for general publication.

New High Energy "Light" Beam

One of the experimental teams at SLAC has aimed a light beam from a laser directly at SLAC's oncoming high-energy electron beam. The particles of light are reflected by the speeding electron beam (as if it were a mirror). The particles of light absorb a great amount of energy from the electron beam as they are reflected. These high energy "light" particles (photons) can then be delivered to the 82-inch bubble chamber where their activities in conjunction with hydrogen nuclei (protons) can be observed.

A - Ok

A new high-power record of 150 kilowatts has been achieved in the A-beam during a high-accuracy experiment of scattering high-energy electrons off protons inelastically. And this using only half the beam.

Research Summary To Date

Experimental operations at SLAC began in late 1966, nearly two years ago. To date, eleven experiments have been completed and their results published and distributed throughout the world. Seventeen other experiments are underway. Involved in these experiments have been over 100 scientists including experimenters from the University of Washington, Johns Hopkins, Cornell, University of Pennsylvania, Northeastern University, Harvard, MIT, Cal Tech, Purdue, University of Hawaii, University of Michigan and the University of California (Berkeley, Riverside, Santa Barbara and UCLA).

SERA

The tragedy which befell Chris Schmierer last year has motivated some SLAC'ers to get together and form the SLAC Emergency Relief Association so we can prepare ourselves for such economic disasters. We will be hearing more about this as plans are formalized.

YOP

For this summer's Youth Opportunity Program, SLAC recruited 46 students at Ravenswood and Menlo-Atherton High Schools for summer jobs here. The entire program was very successful. Typical are the five students employed in SLAC's Theoretical Physics Group who learned scientific computer language and programmed mathematical equations into computer language, used a computer to plot graphs, and carried out numerical analysis computer routines.

Miscellany

The next "orientation" program for new employees will be held at 10:00 a.m. on Thursday, September 12, in the SLAC Auditorium. In addition to discussion of SLAC and its purposes, the SLAC movie will be shown. All new employees and anyone else interested are urged to attend Anyone interested in learning SLAC's policies on publications, reports, preprints, technical notes, public information, patents, etc. should call 528 and ask for a copy of the Technical and Public Information Guide