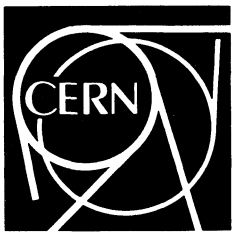

PRESSE

Laboratoire Européen pour la Physique des Particules
European Laboratory for Particle Physics
Europäisches Laboratorium für Teilchenphysik
Laboratorio europeo per la fisica delle particelle

PR 21.89
13.10.89

FIRST PHYSICS RESULTS FROM LEP

Since CERN's new particle accelerator LEP (Large Electron Positron Collider) first came into operation in August, CERN scientists have been implementing a programme of constant improvement which has resulted in a steadily increasing rate of production of Z° particles. The remarkable result has been that in a physics run spanning only three weeks, during which 15 days were allocated to physics experiments and 6 days to machine development, over 11,000 Z° particles were detected by the four experimental collaborations working on LEP (ALEPH, DELPHI, L3, OPAL).

During this run the operators in the LEP Control Room set the energy of the particle collisions in LEP at seven different values, from 89.25 GeV to 93.25 GeV. This enabled the physicists in the four experiments to study the different rates of production of Z° particles at each energy.

On Friday 13th October the auditorium at CERN was packed with scientists eager to hear the first physics results from this energy scan announced by representatives from the ALEPH, DELPHI, L3 and OPAL experiments. About 2,000 scientists from all over the world have worked in these collaborations making this the largest project in the history of Physics.

From the analysis of the data the mass of the Z° particle has been determined as 91.10 ± 0.06 GeV, thus achieving a much higher accuracy than hitherto. The importance of a precise measurement of the Z° mass is that it determines the relative strengths of the Weak Nuclear Force and the Electromagnetic Force.

The next very important result is a measurement of the width of the Z° particle with unprecedented accuracy. This leads to the result that there are no other neutrino types in Nature beyond the three associated with the electron, muon and tau particles. Neutrinos are light, uncharged particles produced by the weak interactions in the Sun, Stars, the Big Bang and also in particle accelerators. Until these experimental results from LEP the number of types of neutrinos had not been determined in a laboratory.

The first two amongst the many experimental aims of LEP have thus been achieved in a remarkably short time.

CERN Media Service, CH - 1211 GENEVE 23
Telephone. : 41 22/767 41 01 or 767 27 22. Telefax : 41 22/ 785 02 47