
Comment

The bulk of this issue is given to describing the progress of the CERN-Serpukhov collaboration. The time is appropriate, since major items of equipment (around 260 tons in weight) are ready for dispatch to the Soviet Union or are already on their way. In Serpukhov arrangements to receive them are nearing completion. In addition, the large hydrogen bubble chamber, Mirabelle (at Serpukhov in the context of an agreement with France) has taken its first photographs receiving particles from the 76 GeV proton synchrotron and the start of collaborative experiments in bubble chamber physics is not far away. Collaborative experiments using electronic techniques have been most fruitfully under way for several years already.

In recalling briefly the outline of the Agreement between CERN and the State Committee of the USSR for the Utilization of Atomic Energy, concerning scientific and technical co-operation at the Institute of High Energy Physics at Serpukhov, we will prepare the way for the following fuller stories on its component parts. The Agreement was signed in Moscow on 4 July 1967. It covered the provision from CERN of a fast ejection system and radiofrequency separator to be used at the 76 GeV synchrotron and the participation of CERN scientists in the experimental programme at what has been for several years the highest energy accelerator in the world.

The ejection system is an extended version of that used on the CERN proton synchrotron extended to cope with higher beam momentum and to give greater flexibility in operation. It will be integrated with another fast ejection system developed by Serpukhov in collaboration with Lenin-grad in such a way that, working together or separately, the systems can provide ejected protons down four different beam lines. The beam-

line towards the Mirabelle chamber is being provided by CERN using an improved version of the type of transport system of the pulsed bending magnets and quadrupoles used at the CERN PS.

The beam-line to Mirabelle will have a radio frequency separator developed at CERN with more advanced performance coming from a new type of r.f. cavity and new control systems. The 4.7 m hydrogen bubble chamber was built at Saclay and then dismantled after testing and sent to Serpukhov from the spring of 1970. In June of this year, reassembly was complete and the first photographs of beam tracks using 70 GeV/c protons from the accelerator were taken. It is ready for its first experiment with unseparated protons of high energy. Bubble chamber experiments with the r.f. separated beam provided by CERN will begin early in 1972. Three French Laboratories, CERN, and several other laboratories from its Member States are preparing to receive pictures from the chamber and CERN has been involved in an advisory capacity in some of the preparations for handling the data from the chamber.

As mentioned above the electronics experiments have been going very well for several years. The second experiment, working with a boson spectrometer, is in full swing and a third is already planned in considerable detail. It will quickly follow the boson spectrometer experiment on to the experimental floor at Serpukhov.

So well has the collaboration gone, it is no longer restricted to a pure dialogue between CERN and Serpukhov. It has widened to include teams rather than just individuals from the laboratories of the Member States. CERN still remains the channel of communication with IHEP but this third electronics experiment will be performed by a team from Karlsruhe which is currently at CERN performing a similar

experiment at lower energies. Other arrangements of the same nature are already under discussion with experiments being proposed by collaborative teams from the CERN Member States.

This introductory paragraph and what follows indicate that the spirit of the Agreement has been fully implemented. Such an extensive and novel collaboration cannot be implemented without problems but these have been surmounted by the vigorous whole-hearted participation of both sides.

The benefits on the physics front needs little emphasis. As a result of the agreement, W. European physicists have had access from the beginning to the highest energies available and Soviet physicists have been able to participate more fully in the CERN programme of research and development while their machine was being completed. But the collaboration has important implications also in terms of relations between nations.

Since the Agreement there have been other examples of getting together in the field of high energy physics notably the protocol signed by the US AEC and the USSR State Committee (described in vol. 10, page 393) and a group from the University of California at Los Angeles working in collaboration with Dubna has just completed data taking on pion electron scattering. It does not seem too presumptuous to suggest that the CERN-Serpukhov collaboration has done a great deal to improve the contacts not only between scientists in Europe but also between peoples in the world.