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DRAFT MINUTES OF AN INFORMAL MEETING TO DISCUSS THE 300 GeV SYNCHROTRON, INTERSECTING STORAGE RING AND OTHER CERN LONG RANGE PROJECTS

10 June 1964

Present: C. Peyrou (Chairman), R. Armenteros, C. Butler, G. Cocconi, A.N. Diddens, T. Ericson, G. Fidecaro, P. Germain, B. Gregory, G. Hampton, M.G.N. Hine, B. Hyams, K. Johnsen, P. Preiswerk, J. Prentki, C. Ramm, C. Rubbia, L. Van Hove, A.M. Wetherell, C. Zilverschoon.

The chairman opened the meeting by proposing the following programme for discussion:

(1) Possibilities and merits of intersecting beam experiments
(2) Competition between the 300 GeV accelerator and the intersecting beam machine
(3) Competition between the storage rings and more general improvements to the facilities at the Meyrin site.

The programme was approved and formed the basis of the meeting.

Under heading (1) a list of conceivable intersecting beam experiments was discussed, these were:

(a) Measurements of the p-p total cross section
(b) Measurements of the elastic p-p cross section (momentum transfer squared limited to less than 1.5 $(GeV/c)^2$)
(c) Studies of inelastic p-p collisions of small inelasticity (transverse momentum less than 1.5 GeV/c)
(d) Studies of inelastic general statistical features (transverse momentum less than 1.5 GeV/c)
(e) Experiments on inelastic detailed features (correlations, etc)
(f) Discoveries (for example quark type phenomena of lifetime > 10^{-8} sec. This point was not discussed further).

For point (a) some reservation was expressed on the feasibility of precise absolute cross section determinations but the accelerator experts present claimed that very accurate beam flux measurements would be possible.

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It was generally felt that points (b), (c) and (d) would be feasible and useful. The high total interaction rate of 10^5/sec, compared with quite normal present day secondary beam fluxes ($\sim 10^5$) into targets was emphasised. Most of the discussion centred on (e) where some division of opinion between the electronic experimenters and the track chamber experts was found. On the one hand it was felt that large aperture magnetic spark chamber systems would yield important, if limited, results on correlation features in jets, on the other hand the bubble chamber practitioners felt that as complete information on each jet could not be obtained the utility of such studies would be small.

In summary the general feeling was that the experiments discussed would be important and feasible but that the returns on the effort put into the jet correlation studies, (e), are quite uncertain.

(2) The competition between the intersecting storage rings and the 300 GeV machine was discussed on the basis of the following questions:

(i) Is it useful to have some results (even if rough) from the colliding beam experiments several year (~ 5) before the advent of the 300 GeV synchrotron ?

(ii) Are the intersecting storage rings necessary in any case for a look at 1700 GeV physics ?

From the theoretical side a strong statement was made that there are no scientific grounds for considering the intersecting beam experiments urgent. The programme of work outlined above must be considered only a very small part of elementary particle physics. Among many other things it leaves out e.g. meson-nucleon collisions, weak interactions and the study of rare events. The meeting in general considered that the 300 GeV project is of primary importance but that the intersecting beam experiments cover a rather narrow but interesting part of particle physics, which should not be abandoned. In other words, it is only in the framework of the ensemble programme of both the 300 GeV accelerator and the storage rings that the latter project should be strongly supported.

The meeting moved on to discuss improvements of the existing CERN experimental facilities under heading (3). The following items were specifically mentioned:

(I) Increase in the PS beam intensity and duty cycle
(II) The construction of a Shutt type 50 m^3 hydrogen bubble chamber
(III) The construction of extremely elaborate electronic experiments

The long discussion in this section of the meeting mainly rotated around the feeling that the normal budget would be inadequate for these improvements.

The previous S.P.C. meeting had rather over-emphasised the colliding beam project and under-emphasised the improvement programme. An analysis of the budgetary increase factor of 3.1 by 1973, for the ensemble programme and improvements in the exploitation of CERN, gave an annual increase of only 7 o/o for the latter. This was felt to be impossibly low, particularly by Van Hove and the potential large bubble chamber users, and generally with respect to increase in the PS performance. On the other hand, Pierre Germain expressed the opinion that when the improvements will be cristallized in the form of definite and concrete projects, the money could be found. Most of the physicists present expressed the opinion that the programme for improving 25 GeV physics experimental facilities was of even greater importance than the storage rings.

The following summary of the conclusions of the meeting was approved:

(A) It was felt that certain parts of the study of very high energy p-p interactions could be well done with the intersecting storage rings, although this feeling was held more strongly by the physicists working with electronic techniques than by the bubble chamber people. It must be admitted that only a small part of elementary particle physics is included in the proposals outlined but the interest of a look through the very high energy window counters this narrowness.

(B) The point on which there has been unanimity since a long time: "The future of high energy physics in Europe depends on the construction of the 300 GeV accelerator, for which the intersecting beam storage rings are not a replacement" is again reaffirmed.

(C) Therefore it is the ensemble programme which should be strongly supported.

(D) The programme for the increased exploitation of the 25 GeV Meyrin site facilities is extremely important and the use of the total budget for CERN Meyrin should be balanced to this view. The improvement of 25 GeV physics should in no way be inhibited nor slowed down by the construction of intersecting beam storage rings.

Distribution: Director General
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Participants of the meeting

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