DRAFT MINUTES OF THE CERN EMULSION EXPERIMENTS

COMMITTEE HELD ON FEBRUARY 11TH, 1964

PRESENT

A. Apostolakis                Oxford
G. Baumann                   Strasbourg
A. Bernheim                  Paris (Morand)
H. Braun                     Strasbourg
E.H.S. Burhop                U.C. London
C. O’Ceallaigh               I.A.S. Dublin
J.C. Combe (Secretary)       CERN
G. Cortini                   Naples
P. Cler                       Strasbourg
G. Cvijanovic                Bern
M. Danysz                    Warsaw
B.J. Diff                     U.C. London
A.G. Ekspong (Chairman)      Stockholm
J. Faín                        Clermont-Ferrand
K. Gottstein                  Munich
J.A. Geibel                  CERN
B.P. Gregory (part-time)    CERN
K. Hansen                    Copenhagen
D. Harmsen                   Hamburg
J. Hébert                     Ottawa
W. Hitzeroth                 Munich

L. Hoffmann                  CERN
E. Jeannet                   Bern
G. Kellner                   Vienna
J.P. Lagnaux (re J. Sachon)  Brussels
K. Lanius                    East-Berlin
R. Llosa                     CERN-Valencia
W.O. Lock                    CERN
M. Morand                    Paris
J. Palard                    Clermont-Ferrand
J. Pniewski                  Warsaw
Y. Prakash                   Oxford
M. Scherer                   Caen
V. Scheuing                  Munich
W.T. Toner                   CERN-British Em. Cttee.
L. Var Hove                  CERN
E. Villar                    Valencia
V.F. Weisskopf (part-time)  CERN
H. Winzeler                  CERN
J. Zakrzewski                Warsaw
P. Zielinski                 CERN-Warsaw
1) Report on experiments and irradiations made since October 1963

At the PS

Magnetic moment of the $A^0$ [Bristol, CERN, Lausanne, Munich collaboration].
a $\pi^-$ beam, $\pi^- 1.05$ GeV/c. Run made successfully in October, 1963. Six
shifts spread over one month at the average rate of one pulse in ten.

Irradiation to 3 GeV/c $K^-$ [Amsterdam, Hamburg, Strasbourg, U.C. London,
W.C. London, Brussels, Prague, Warsaw, CERN (reserve stack)]. $m_3$ beam.
October 25-26 1963, four shifts.

Small-angle $p-p$ scattering [Rome]. Internal beam 24 GeV and a CH$_2$
More exposures are needed at several energies ranging from few GeV up
to 28 GeV.

At the SC

Stopping $\pi^+$ [Strasbourg]. 70 MeV channel. December 12, 1963 (about
one hour).

2) Report on the present state of the experimental programme
(see table 1. Experiments with *).

For the PS

Study of neutrino interactions using photographic emulsions in
conjunction with spark chambers (U.C London-CERN).
The working party composed of A.G. Ekspong, C. Franzinetti, A. Manfredini
and L. Van Hove has judged from the results of the trial experiment that
the location of tracks in emulsion is proved, and therefore the Committee
asks this experiment to be considered as a supplementary technique to be
used in a new neutrino programme.
Small-angle p-p scattering (Hamburg). A first test (which, if successful, could be a partial run) was made in February a few days after this meeting.

Nucleon spectroscopy (Copenhagen-Bombay)
First tests were made at the same time as those for small-angle p-p scattering.

Small-angle π⁻p scattering (Munich) is ready to be scheduled in the o₂ beam. The majority of the irradiations to 5.5 GeV/c K⁻ are scheduled for March in the o₂ beam.

The magnetic moment of the π⁺ is expected to be ready to start in June. The major technical problem which remains is the successful running of a liquid hydrogen target in conjunction with a coil producing a 200 kilogauss pulsed field.

For the SC
Comparison of energy loss for π⁺ and π⁻ (Stockholm)

A large part of the preparatory work has been done. A MC magnet has been set up and tested to be used as a spectrometer and a separation in momentum better than 0.2% has been shown feasible, using the two close lines of a ThC source as a probe. First trials in the 70 MeV channel are foreseen in March.

3) New proposals (see Table 1, experiments without *)
These new proposals were discussed but no decision was taken. They will be considered again at the next meeting after being considered by the referees.

4) Any other business
The results of the questionnaire on the future development of nuclear emulsion work are summarized in the report EmC 64/2 which is circulated with these minutes.

The next meeting will be held on April 14th at 2.30 p.m. J. Combe.
<table>
<thead>
<tr>
<th>Beam</th>
<th>Experiment, reference and laboratories involved.</th>
<th>Purpose</th>
<th>Shifts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>a_5</td>
<td>E 11a EmC 62/5, 10 (Bristol, CERN, Lausanne, Munich, Rome).</td>
<td>Magnetic moment of the τ⁺ hyperon</td>
<td>6 - 8 (30 - 40 at 1 pulse in 5.)</td>
<td>Will be ready to start in June. Beam tests to start in May.</td>
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<tr>
<td>o_2</td>
<td>E 42 EmC 63/1, 7, 13 (U.C.London, W.C.London, Brussels, CERN, Warsaw, Strasbourg, Hamburg, Prague)</td>
<td>5.5 GeV/c K⁻ in emulsion for hyper-fragment studies</td>
<td>6</td>
<td>Production run</td>
</tr>
<tr>
<td>o_2</td>
<td>EmC 64/6 Oxford</td>
<td></td>
<td></td>
<td>To be made at the same time as E 42.</td>
</tr>
<tr>
<td>o_2</td>
<td>E 43 EmC 63/14 (Munich)</td>
<td>Small-angle π⁻ - p scattering at 10 to 15 GeV/c (hydrogen gas target)</td>
<td>6</td>
<td>Tests (for the best conditions for a low t + production run.</td>
</tr>
<tr>
<td>o_2</td>
<td>E 50 EmC 64/1 (Hyderabad) EmC 64/7 (French collaboration) (Caen, Clermont-Ferrand, Lyon, Paris, Strasbourg).</td>
<td>5.5-6 GeV/c p⁻ p interaction in emulsion nuclei (fragments, hyper-fragments, p-bound p).</td>
<td>2</td>
<td>To be considered later.</td>
</tr>
<tr>
<td>o_8</td>
<td>E 45 EmC 62/44, 63/5, 10 Valencia, Moscow (Leb. Inst.), New-Delhi, Alma-Ata.</td>
<td>Miscellaneous proton irradiations with or without 200 kilogauss pulsed field.</td>
<td>2</td>
<td>Wait for suitable beam.</td>
</tr>
<tr>
<td>* Fast ejected proton beam inside the ring</td>
<td>E 46 EmC 63/12 (Hamburg)</td>
<td>Small-angle p-p scattering using hydrogen target.</td>
<td>4</td>
<td>Tests made on February 14th. If successful, production run at several energies.</td>
</tr>
</tbody>
</table>

* Proposals already accepted by NFRC at previous meetings and to be scheduled.
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<tr>
<td>id. a</td>
<td>E 48 EmC 63/15 (Bombay-Copenhagen)</td>
<td>Nucleon spectroscopy</td>
<td>3</td>
<td>Wait for results of tests made on February 14th.</td>
</tr>
<tr>
<td>id.</td>
<td>E 52 EmC 64/4 (CERN-Warsaw)</td>
<td>Fast fragments production and analysis using a 200 kilogauss pulsed magnet as a spectrometer.</td>
<td></td>
<td>Wait for results of tests made on February 14th.</td>
</tr>
<tr>
<td>id.</td>
<td>E 53 EmC 64/5 (Munich)</td>
<td>Production and interaction of negatively charged hyperons in a 200 kilogauss pulsed field</td>
<td></td>
<td>Wait for results of tests made on February 14th.</td>
</tr>
<tr>
<td>Internal proton beam a</td>
<td>E 47 EmC 63/4 (Rome)</td>
<td>Small-angle p-p scattering using a thin polythene target.</td>
<td>6</td>
<td>Successful test made in December 1963. Production run at 6 energies (28,20,10,6,4,1).</td>
</tr>
<tr>
<td>m4</td>
<td>E 51 EmC 64/3 (European K^- collaboration)</td>
<td>$\Sigma^-$ produced by 1.5 GeV/C $K^-$. Strength of the $\Lambda$-$\Lambda$ interaction by observation of the decays of double hyperfragments.</td>
<td></td>
<td>To be considered later.</td>
</tr>
<tr>
<td>$\nu$ beam</td>
<td>E 49 EmC 63/19 (U.C London-CERN)</td>
<td>Experiments to study neutrino interactions using photographic emulsions in conjunction with spark chambers</td>
<td></td>
<td>Asked to be considered as a supplementary technique to be used in a new neutrino programme.</td>
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<tr>
<td>70 MeV channel*</td>
<td>E(SC)2 EmC 63/21 (Stockholm)</td>
<td>Comparison of energy loss for $\pi^+$ and $\pi^-$</td>
<td>6</td>
<td>Tests on technical feasibility under way. If successful, production run.</td>
</tr>
<tr>
<td>300 MeV protons*</td>
<td>E(SC)3 EmC 63/22 (Stockholm)</td>
<td>Range of heavy ions (down to 2 MeV)</td>
<td>1</td>
<td>Has been shown to be technically feasible. To be scheduled.</td>
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