

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

CERN LIBRARIES, GENEVA



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PH I/COM-69/43
17 September, 1969

M E M O R A N D U M

To : The Members of the Electronics Experiments Committee
From : CERN-Munich MPI Collaboration
Re : Status of equipment for Experiment S94 after the run in t₁ beam
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We have tested in the t₁ beam a set of wire spark chambers with magnetostrictive readout on-line to a PDP9 computer. This apparatus will be part of our proposed experiment (PH I/COM-68/44, of 13 Sept., 1968).

The chambers were of the following type:

- A. 9 chambers, sensitive area 50 x 50 cm, 90° between high voltage and ground wires, respectively.
- B. 1 chamber, sensitive area 330 x 90 cm, 30° between high voltage and ground wires, respectively.

The following properties of the chambers have been determined:

1. Efficiency. The efficiency for the track triggering the chambers was over 98%, and dropped to less than 20% for tracks arriving 1 μs earlier. No significant difference has been found between single track and two-track efficiencies.
We observed spurious sparks in less than 20% of the triggers.
2. Trigger rate dependence of magnetostrictive signals.
The signal height was constant up to trigger rates of 40 sec⁻¹. At a rate of 100 sec⁻¹ it dropped by 30%. The pulse height jitter was 20%.
3. Measuring accuracy. The measuring accuracy has been deduced from straight line fits to particle trajectories observed in 5 of the small chambers (type A) and in the big chamber. In the small chambers we observed an r.m.s. error of $\approx .25 \pm .05$ mm. In the big chamber we obtained an r.m.s. error of $.33 \pm .07$ mm. The absolute (positioning) error of the big cham-

ber over the total range of 330 cm was $.25 \pm .25$ mm.

These measurements show that we have produced chambers of the required size, to work with the precision and repetition rate stated in our proposal.

The series production of the large magnetostrictive chambers has begun in Munich, and is planned to be completed by early December 1969.

Tests were also made on two "sparkostrictive" chambers. They worked efficiently, but gave a standard deviation of about 1 mm in the coordinate measured. It is not clear to us whether or not this can be improved. Therefore, although this work may be continued in Munich, we have decided not to use any "sparkostrictive" chambers in this experiment.

As a result of this decision we have to modify the AEG magnet in two ways: We have designed a shunt to reduce the external stray field to less than 30 gauss, and we will open the central slot to insert chambers at the centre of the magnet. This necessitates measuring a new field map which we plan to do towards the end of the P.S. shut-down.