

SOME ASPECTS OF FUTURE ACCELERATOR RESEARCH

These notes are based partly on a discussion between T.G.P., L.B.M., W.W., M.S., and J.D.L. on August 20th; comments not made at the meeting are in square brackets [thus].

1. Those concerned with accelerator research (and not members of the 7 GeV project) should be available when required to make estimates of cost, timescale and staff requirements for 'conventional' accelerators and to suggest suitable parameters when required to do so by possible 'customers', or by research group/need advice.
2. These people will keep themselves generally informed, but will not make specific design studies of hypothetical 'conventional' machines unless specifically asked to do so.
3. It is unlikely that a large electron synchrotron or linac will be built in the near future, and therefore we shall make no further studies of these machines at present.
4. Experimental effort is limited and should not (for the next few years at any rate) be deployed on:
 - a) any aspect of proton synchrocrash, since such a machine is unlikely to be built here because of cost,
 - b) any aspect of electron synchrocrash, since this is a 'one experiment' machine unlikely to be built here, and anyhow Panofsky's experiment on the Stanford linac looks more promising.
5. An electron model using tight spirals has proved too large a project for the present team (which cannot be expanded), and further no machine using such tight spirals is contemplated at present. The present model, which cannot work as originally planned because tolerances have not been met, should nevertheless be continued until the end of the year, by which time some sort of beam should be obtained. The work must not continue beyond the end of the year.
6. The proton model is in a happier state, and because of its uniqueness and greater generality should be of greater value. It is too small however to tell us all we need to know, and should be followed up by a

10 MeV model. Alternatively the work could be carried out on an existing 10 MeV machine, and Dr. Pickavance will ask Professor Skinner if we can have the Liverpool machine. [At the meeting it was suggested that the work might be carried out at Liverpool, or even in collaboration with Professor Heyn at Delft, however on thinking it over, it would seem better to have the machine here.] This model should be started by the existing 'electron' and 'proton' teams combined in about 18 months time. Not only S/R problems but also the 'pooped-up centre' and c.w. - f.m. transition could be studied with the aid of suitable pole pieces and dee systems. In the mean time the electron team will carry through the $Q_v - Q_n$ pinhole experiment, [and give thought to shimming problems. Experiments on low field measurements and factors affecting remanence to be continued.] It was also suggested that r.f. coupling problems, relevant to the linac, but of wider interest, could be studied.

8. Close liaison to be kept with the chemists, and possibilities of a heavy ion machine to be studied in detail when their requirements are known.

J. D. Lawson.
August 21st, 1958.

Copies to Dr. Pickavance
Mr. Mullett
Mr. Walkinshaw
Mr. Snowden
Mr. Lawson

I have tried to
set down some of
the points established at
our meeting. I should
welcome any comments.

J.D.L.