



CM-P00071751

ISR PERFORMANCE REPORT

RUN 430, 9.3.1974

Ring 1, 26 GeV

Electron-Proton lines and resonancesSummary

We investigated a possible correlation between e-p lines and resonances by moving a stack to different locations in the $Q_H - Q_V$ diagram. No clear correlation could be observed in this run.

1. Introduction

During earlier observations ¹⁾ we saw some correlations between e-p lines (or apparent e-p lines) and non-linear resonances: e-p lines seemed to appear when the tails of the stack reached into a resonance and the observed e-p oscillation frequency was often on or close to a resonance. A possible explanation for this correlation between resonances and e-p lines (or apparent e-p lines) has been given by H.G. Hereward ²⁾. In the present experiment we tried to investigate this correlation further.

2. Experiment

A stack of ~ 4.3 A on a FP-line was made. First this stack was positioned in a resonance free region (stack 1). Later we moved this stack by $\Delta Q_H \sim 0.03$. This stack 2 contained no resonances. Finally we moved the stack by $\Delta Q_H = \Delta Q_V \sim -0.02$ and obtained a stack 3 containing a 3rd order vertical resonance. The location of these three stacks in the $Q_H - Q_V$ diagram is shown in Fig. 1, while the Schottky scans can be seen in Fig. 2.

3. Observations and results

With stack 1 we observed an e-p line (or apparent e-p line) at ~ 120 MHz which was predominantly horizontal. This line was always quite small, sometimes stable and sometimes pulsing with a repetition rate of ~ 100 Hz.

Stack 2 showed the same line with the same behaviour. For a while a second line with similar behaviour and frequency appeared, but disappeared later. With stack 3, again the same line as in stack 1 was observed. We tried to measure the frequency f_{line} of this mainly

horizontal oscillation and found (Fig. 3):

$$\frac{f_{\text{line}}}{f_0} \sim n - 0.661$$

This is not inconsistent with the 3rd order resonance; however, this resonance is slightly outside stack 3.

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A. Hofmann

References

- 1) O. Gröbner et al.; ISR Perf. Report, Run 400, 19.12.1973
- 2) H.G. Hereward; ISR Perf. Report, 4.3.1974

Fig 1, Location of the 3 stacks.

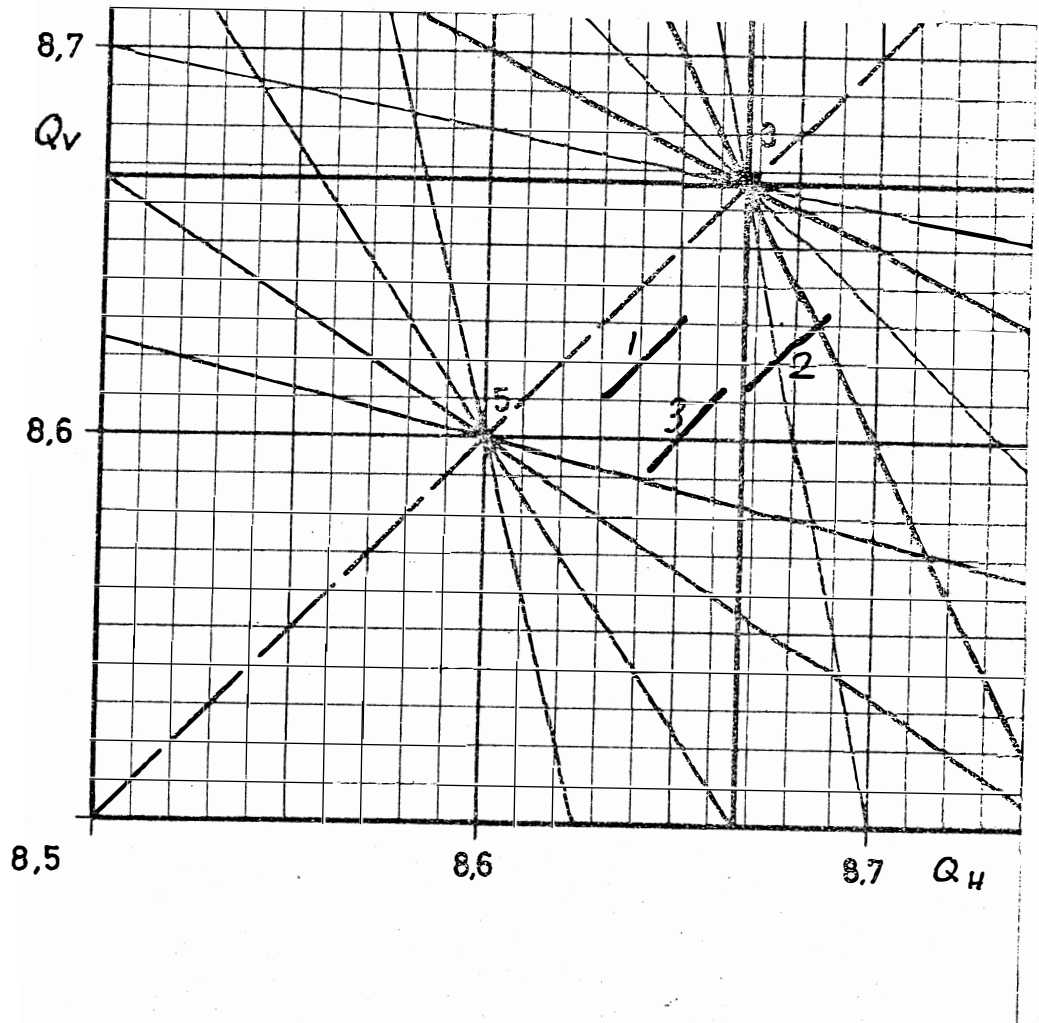
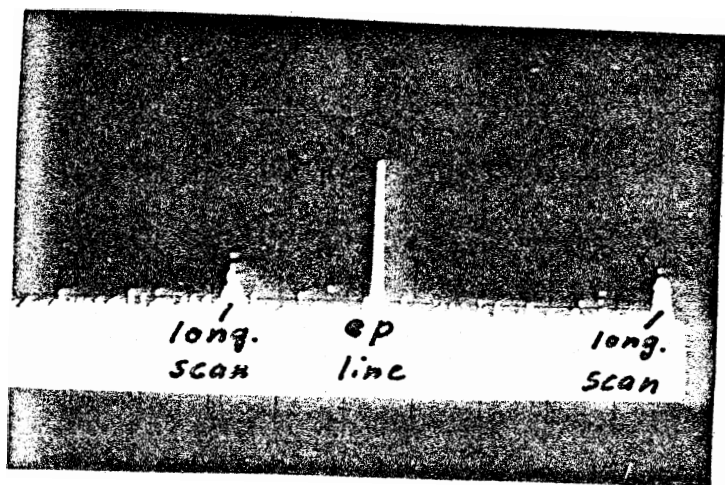
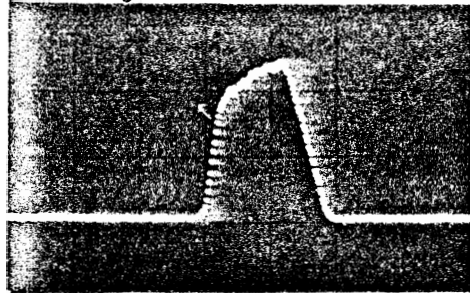


Fig 3. Measurement of the ep oscillation frequency



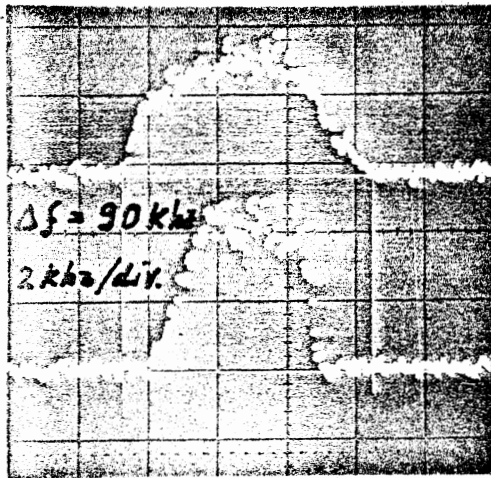
longitudinal scan



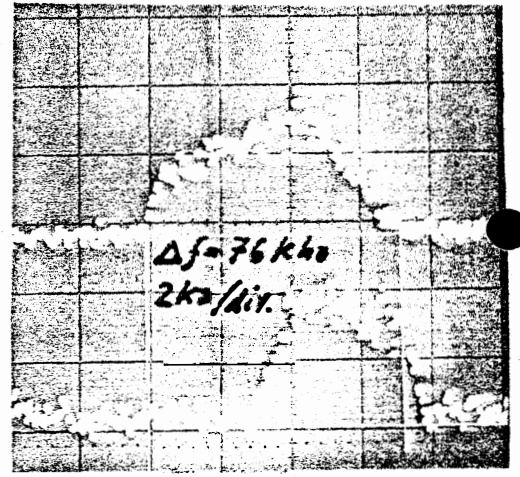
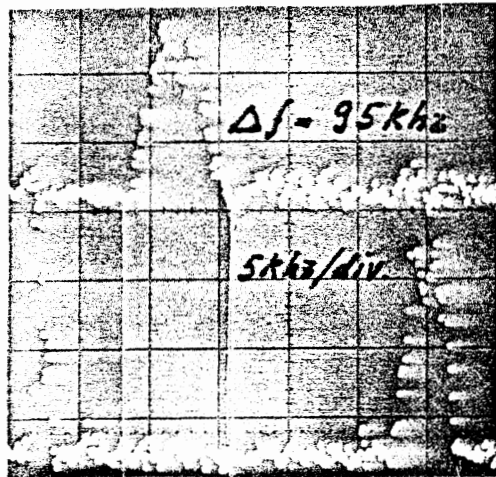
horizontal scan

vertical scan

Stack 1



Stack 2



Stack 3

