

ISR RUNNING-IN

Run 74, 20 bunches, 22 GeV,
working point FS 22. Stacking at the bottom.

Studies with vertically blown-up beams
and dilute stacks

1. Figure 1 : stacking was stopped at just over 4 A, and vertical kicks (about 0.4 mm each) were applied by the Q-measuring kicker. The first kick - applied to an apparently very stable beam - produced about 220 mA loss and a subsequent decay rate of $5.5 \times 10^{-3} \text{ min}^{-1}$. Further kicks, 100 in total, did not change the rate nor produce further sudden loss. The pressure in SS 333 did not decrease, but rather showed a slow steady increase, continuing after the last kick.

A second stack, stopped at 3.7 A and subjected to the same treatment, (Fig. 2) showed similar behaviour, except that most of the sudden loss occurred at the 5th kick (and some at the 1st and the 60th) and that the pressure now kept slowly decreasing, something which, at this lower current, had already been observed earlier during the run when no kicks had been applied.

Both stacks were continued and reached about 4.8 A before stacking downwards and rapid decay occurred.

Conclusions

Parts of a seemingly stable 4 A beam only need a small kick to become unstable. The vertical beam dimension seems to have no effect on the current limit, nor on the pressure rise (at least not in the round pipe of SS 333).

2. Stacking at the bottom was carried out with 22 Hz increments in one case and 20 Hz in another (instead of the normal 15 Hz), in order to see the current limit and pressure rise for less dense stacks. Unfortunately r.f. troubles occurred in both cases, leading to premature

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saturation at 3.1 A in the first case and 3.56 A in the other. Fig. 3 shows the scan and PICD + pressure recording of the second stack. The pressure rise seems approximately normal for that current, but the experiment should be repeated under clearer conditions.

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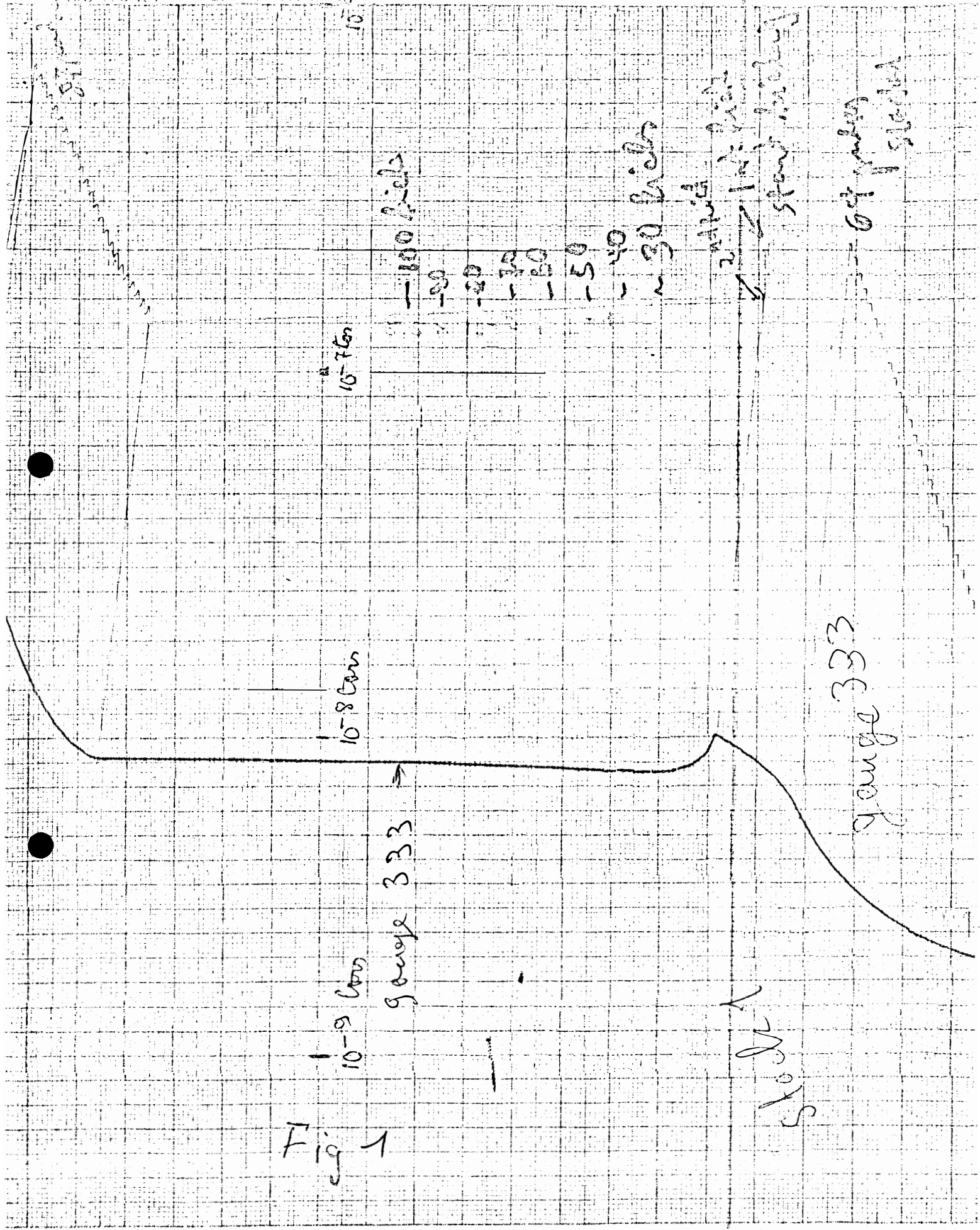
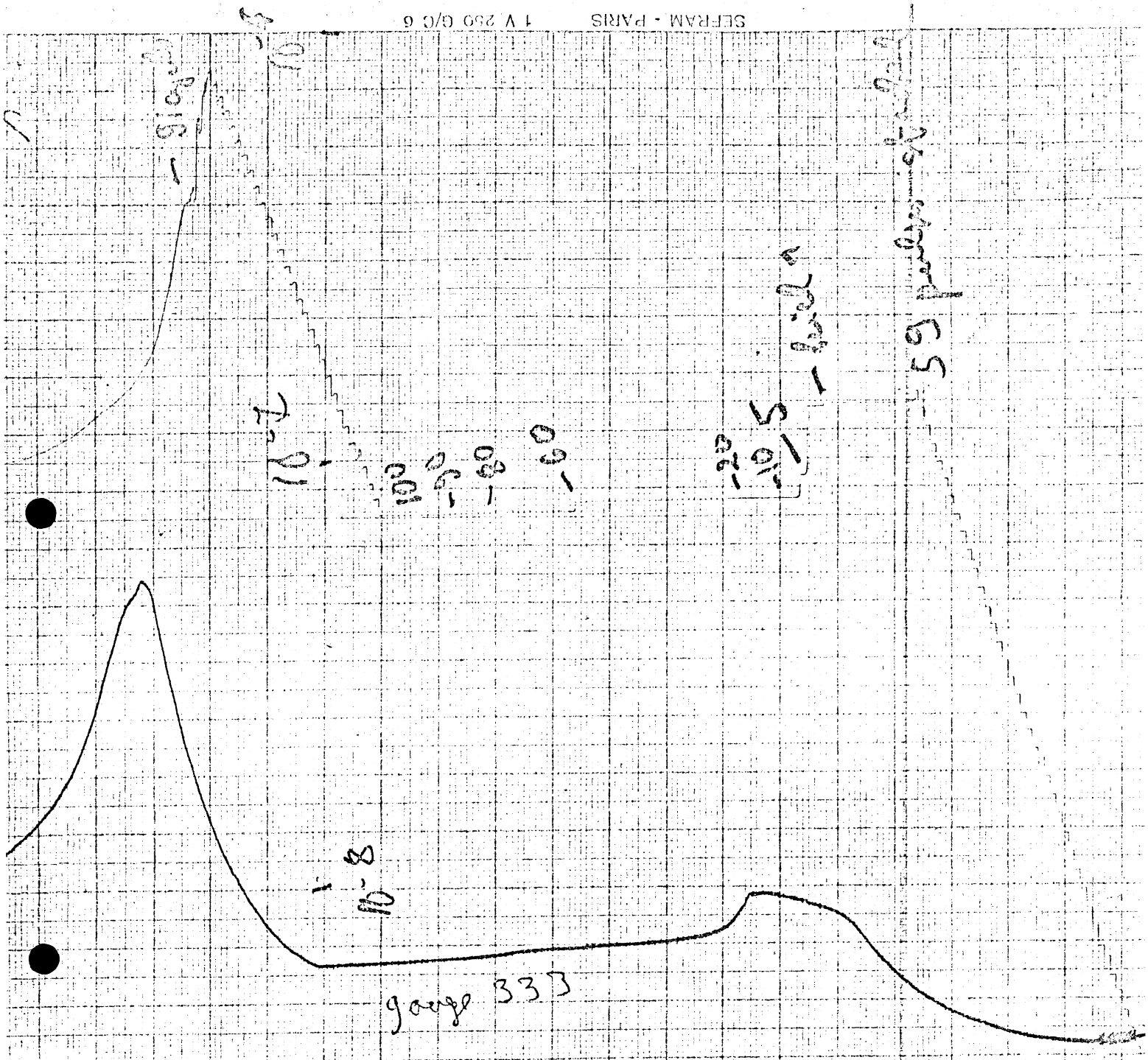


Fig 1



10-9
10-9

Fig 2

scan photo w. s.c.m.

3-5

3.56 A

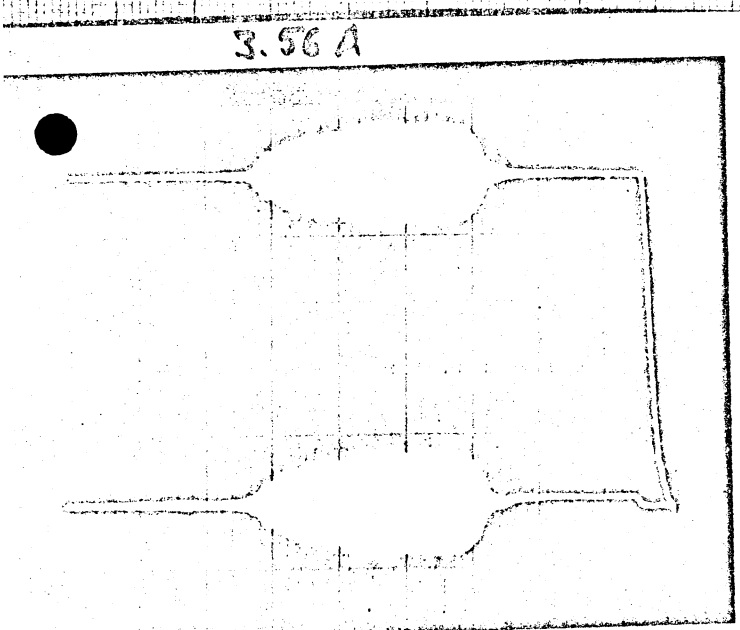


photo 1 w.s.c.m. Pin 74 20112 microm.

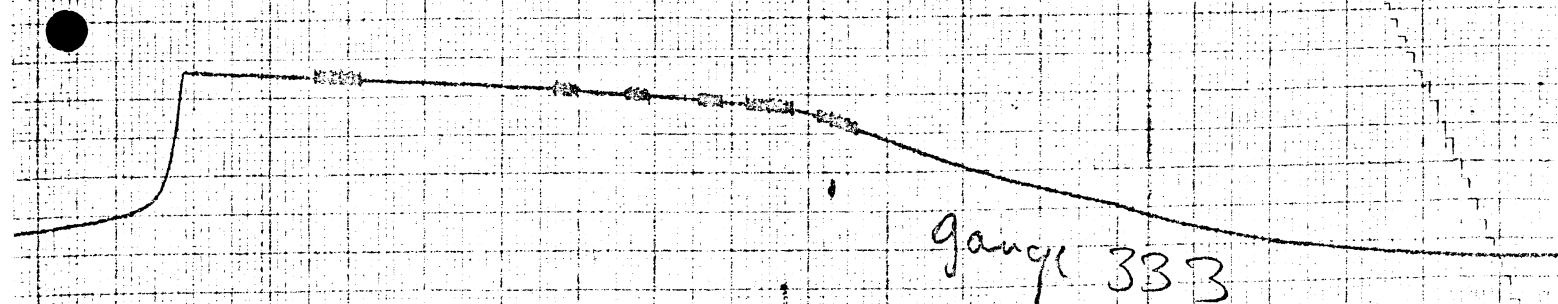


Fig 3