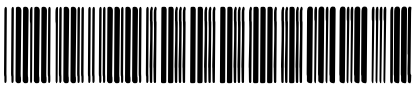


ISR-OP/FL/ps

12th September 1973

ISR PERFORMANCE REPORT

Run 354, 26.6 GeV/c, 6th September 1973

Horizontal and vertical aperture

Aim: to check if any aperture limitation can explain the high decay rates observed during physics runs for several weeks.

Conclusion

- Ring 1: $\bar{\alpha}_p$ horizontal free aperture from +55 to -51.1 mm (lack of time for studying vertical aperture)
- Ring 2: $\bar{\alpha}_p$ horizontal free aperture from +54.2 to -48.3 mm
  - the vertical free aperture minimum between +54 and -25 mm ($\bar{\alpha}_p$) is -21 mm measured with the lower edge beam probe (β_v = 47.6 m)
  - so the horizontal apertures for both beams and the vertical aperture for Ring 2 are enough for physics stacks.

1. Experiment in Ring 1

We injected one pulse (4 bunches, 15 mA) in the ring and displaced it radially with the RF until losing part of current. Then with the beam probes we found +70 mm outside ($\bar{\alpha}_p$ = 55 mm) and, after moving out the girder, -65 mm inside ($\bar{\alpha}_p$ = -51.1 mm).

We had only 10 min for studying this ring and it was not possible to do vertical aperture measurements.

2. Experiment in Ring 2

(a) Radial aperture

As for Ring 1 we measured with a beam probe a radial free aperture from +69 mm to -61.5 mm ($\bar{\alpha}_p$ = 54.2 to -48.3 mm).

(b) Vertical aperture

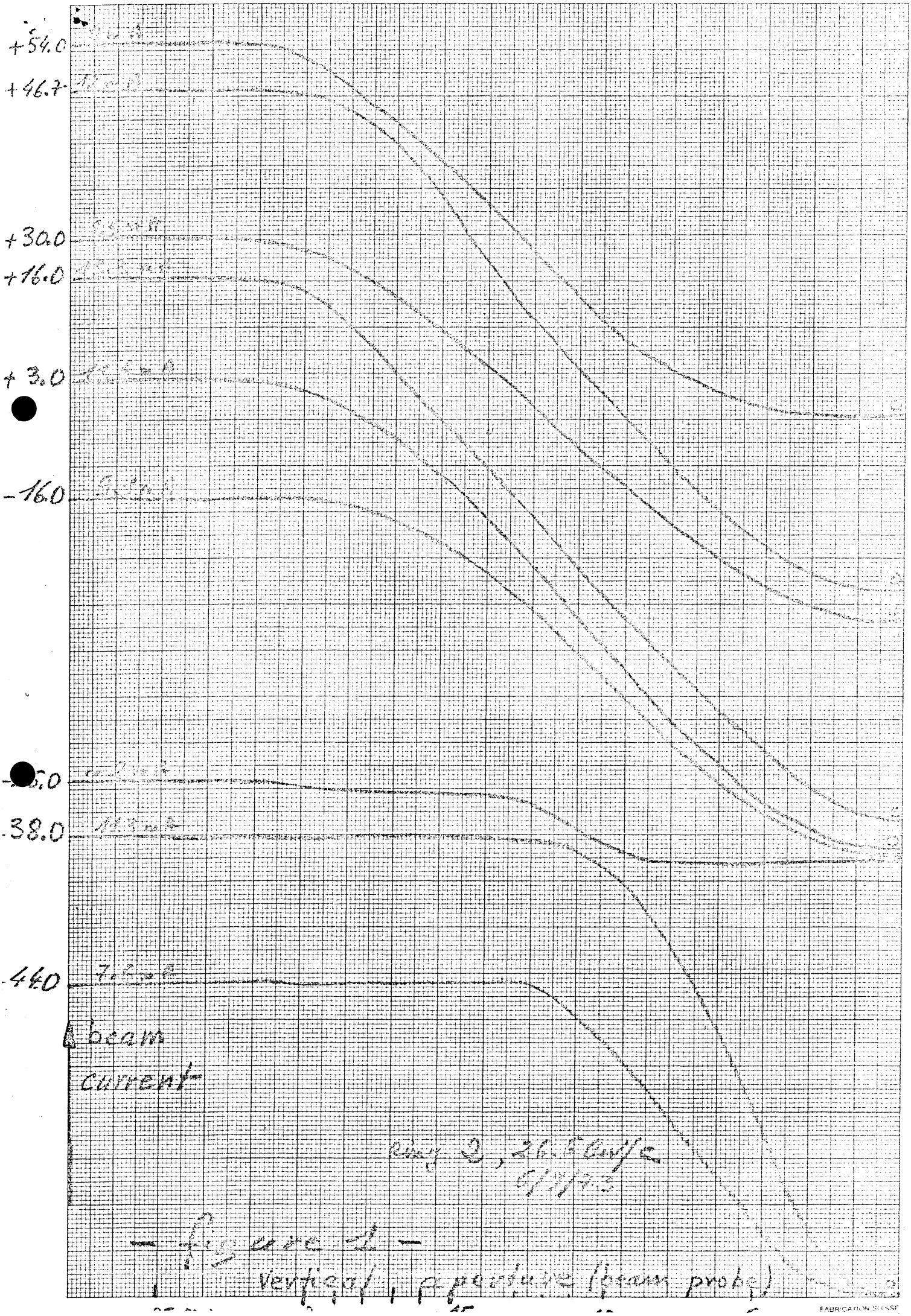
We injected one pulse and accelerated it at a radial position. Then we kicked it vertically until partial loss of current occurred and measured the vertical beam profile with the beam probe lower edge.

Curve 1 gives the profiles for 9 radial positions from +54.0 to -44 mm ($\overline{\alpha}_p$).

We can see a ±21 mm vertical aperture (β_v = 47.6 m) from +54 mm to -25 mm. At this last point the low current after kicking can explain the small amount of current lost when starting to scrape.

At -38.0 and -44 mm the girder not removed can explain the ±13 mm aperture.

F. Lemeilleur


+54.0
+46.7
+30.0
+16.0
+ 3.0
-16.0
-38.0
-44.0
Beam current
Vertical profile (beam profile)