

ISR/VA/NH/sm

9th October 1981

ISR PERFORMANCE REPORT

Run 1202 MD - 12th-13th June 1981

Vacuum Tests in Rings 1 and 2Summary and conclusions

The vacuum stability of rings 1 and 2 was tested with currents higher than 50 A. Ring 1 was unstable at 52.5 A (runaway in 501.6) whereas Ring 2 was perfectly stable at 55.28 A. Long term stability limits are expected to be about 43 A in ring 1 and higher than 55 A in ring 2.

The Experiment

Two vacuum limit tests were planned during an especially long MD period. The ring 1 MD lasted from 12.6.81, 22.00 h, until 13.6.81, 15.00 h (PS unavailable from 5.00 h until 14.00 h). 41.6 A were stacked (density 1A/mn) and kept circulating for 9 hours during the PS breakdown. 10.9 A were added after this long period and the maximum stored current was 52.2 A. Stacking was stopped at this level because of excessive losses when trying to stack further.

The ring 2 vacuum test was started on 14.6.81 at 02.00 h and ended at 10.00 h. A first stack (55.28 A) was completed at 05.34 h and observed during half an hour. As no major weak point showed up (largest pressure increase .6 pT in 212) and as 3 hours were left, the ring being set up for high intensity stacking, it was decided to dump that beam and to make another attempt to reach 60 A. Unfortunately, several problems (PS intensity, RF) occurred and a test stack was lost at 46.5 A (density .9 A/min).

ObservationsRing 1

The vacuum was quite stable around the ring except in the following locations:

- 333.6 slow increase of the pressure at 41 A (+ 1.4 pT after 9 hours), reaching 4 pT at 52.5 A (fig. 1).
- 501.6 weakest point during that run (fig. 2). The pressure increased steadily during the 9 hours at 41 A (+ 3 pT). Increasing the current to 52.5 A led to a runaway $\Delta P > 100$ pT). It has often been observed in the past that after an intervention on the Beam Profile Monitor the vacuum system needs two bakeouts in order to be stable at high intensity.

Beam pumping was manifest in 149.7 (- 1.5 pT). Sectors 61 and 81 which have shown pressure activity during the last run (MD 1128) were quite stable at that time.

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Ring 2

This ring was not tested since R 1134 (12.6.80) when the record current 56.4 A was reached. During that run, the highest pressure increase was .6 pT at 55.28 A in 212. Other observations are listed below:

- 248.4 collimator heating during setting up (+ 10 pT) (fig. 3)
- 332 strong beam pumping (- 3pT)
- 336 ditto 332
- 512 slight pressure increase (+ .2 pT). Pick up not glow discharged.
- 528 ditto 512
- 600.7 beam loss at the end of the stacking period (aperture full) (fig. 4).
Beam pumping visible as the beam was dumped.
- 768.1 beam losses during the stacking; some beam pumping.
- 800.2 ditto 768.1 (fig. 5).

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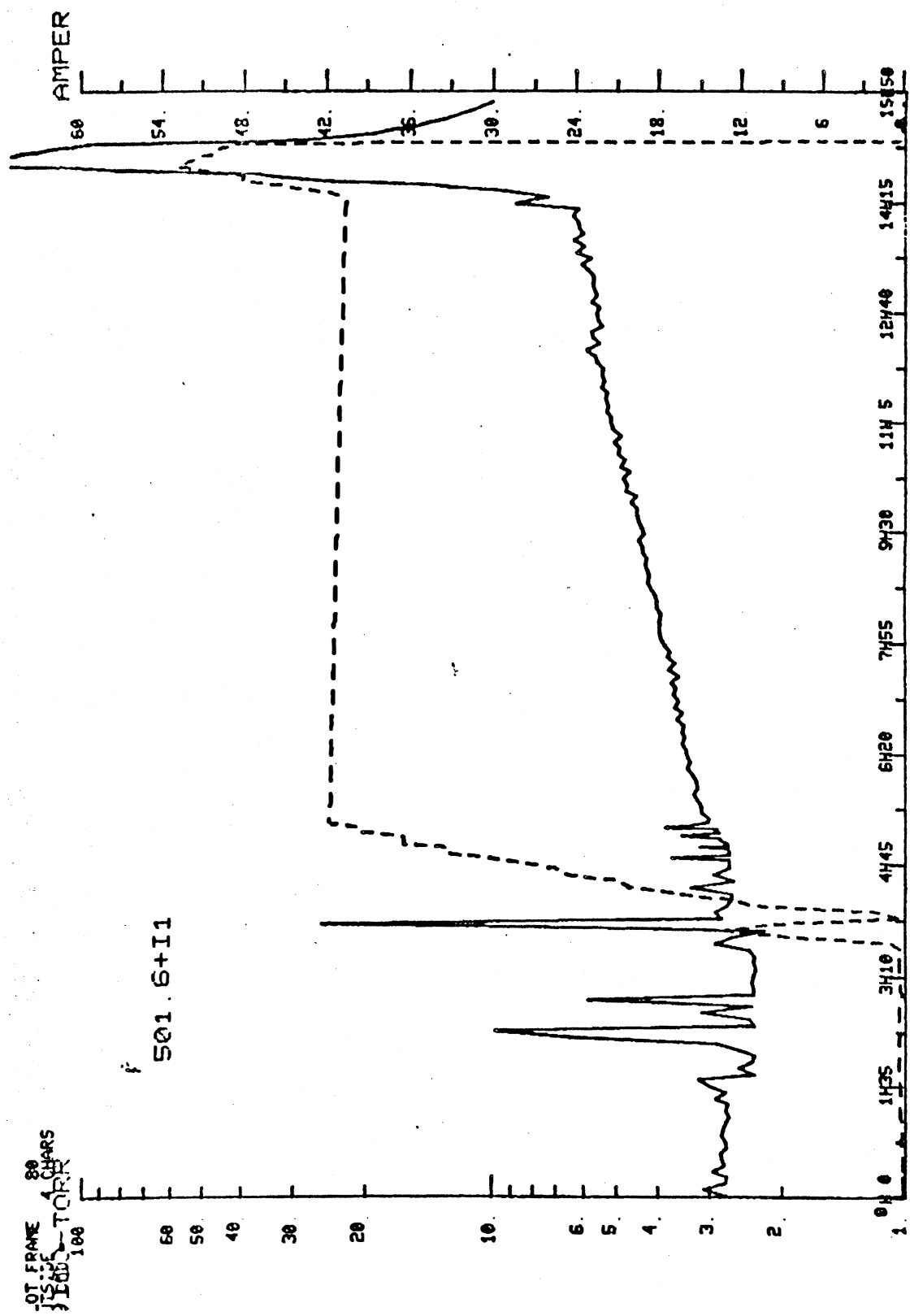


Figure 2

EFF
CL

248.7

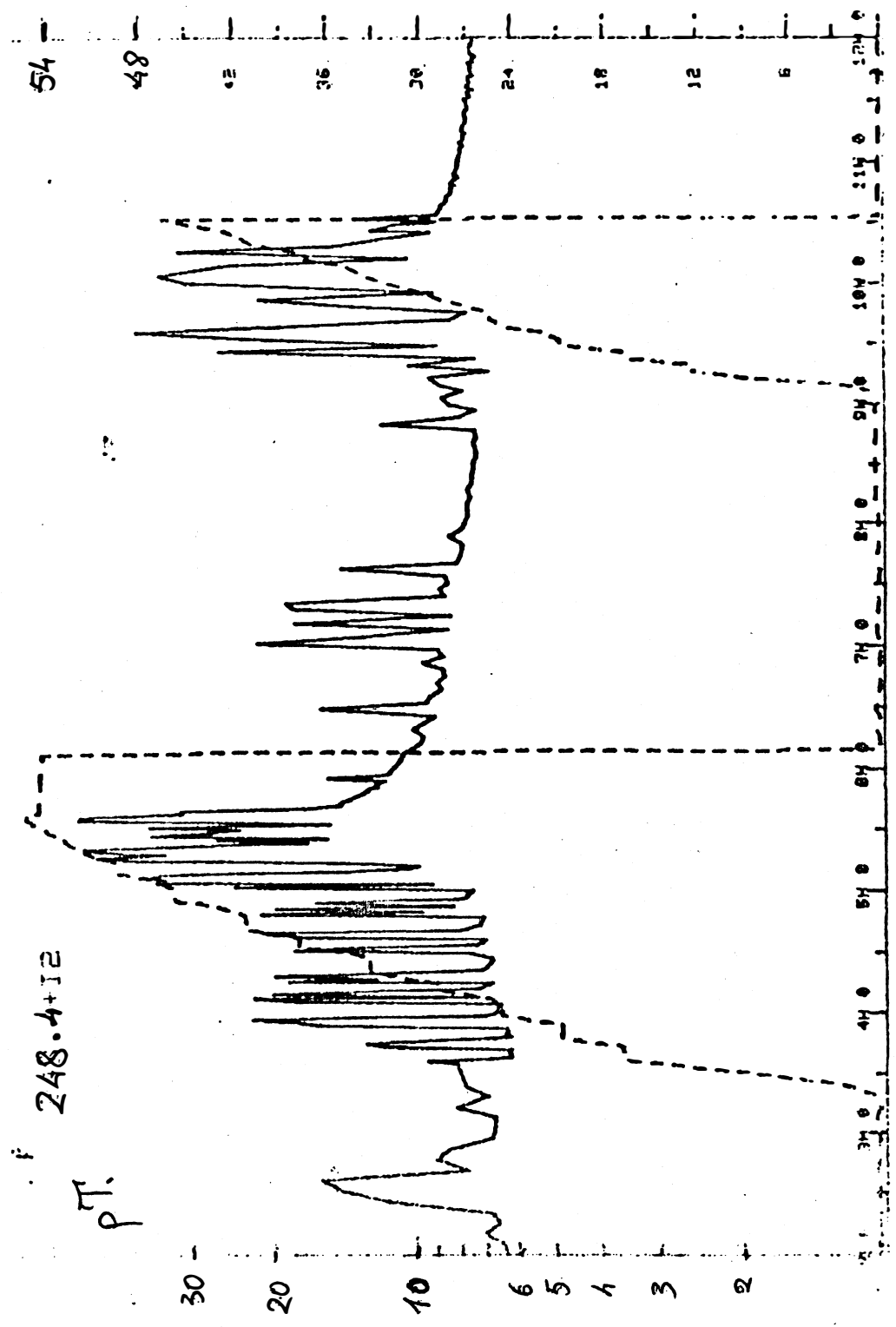


Figure 3

600.7

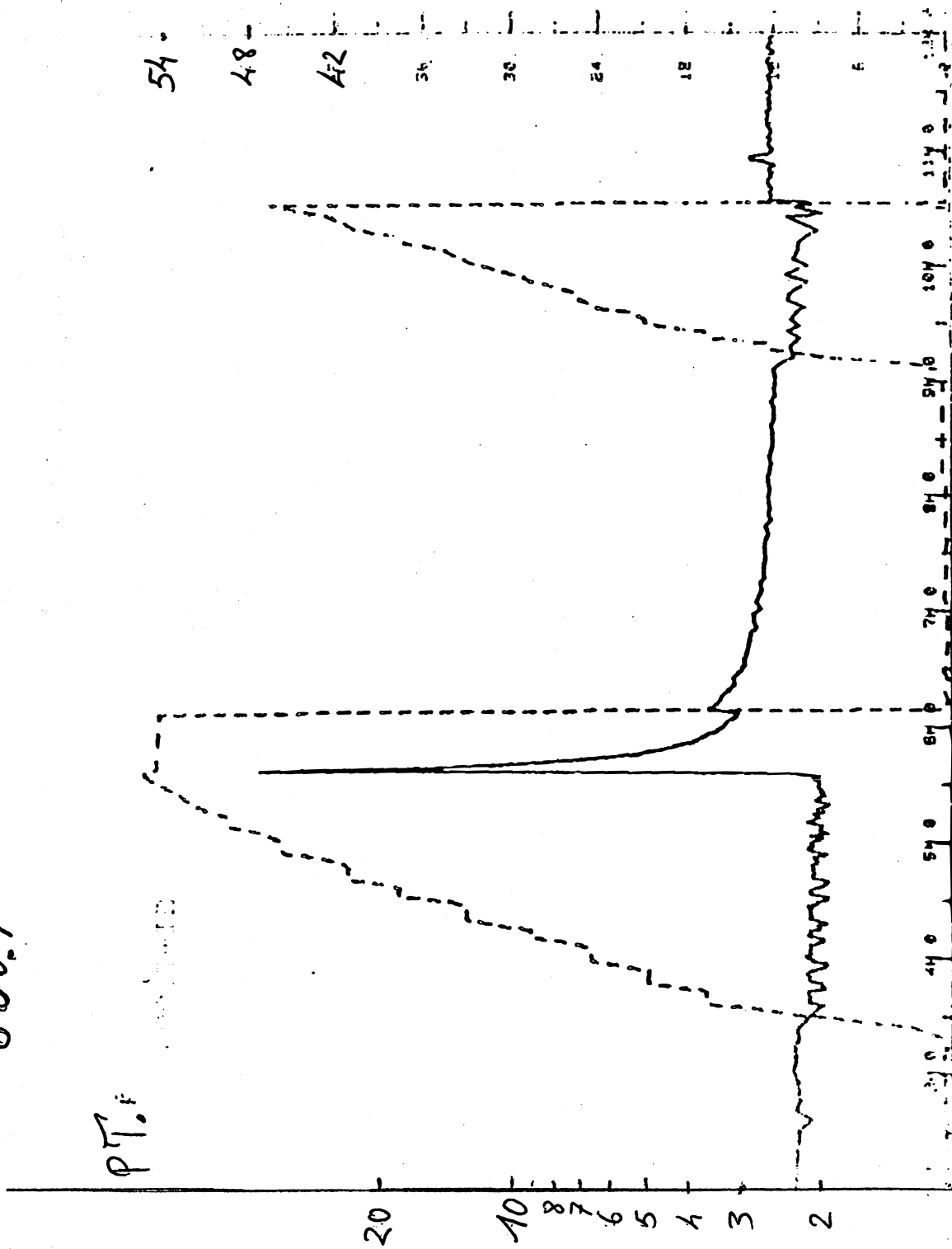


Figure 4

800.2

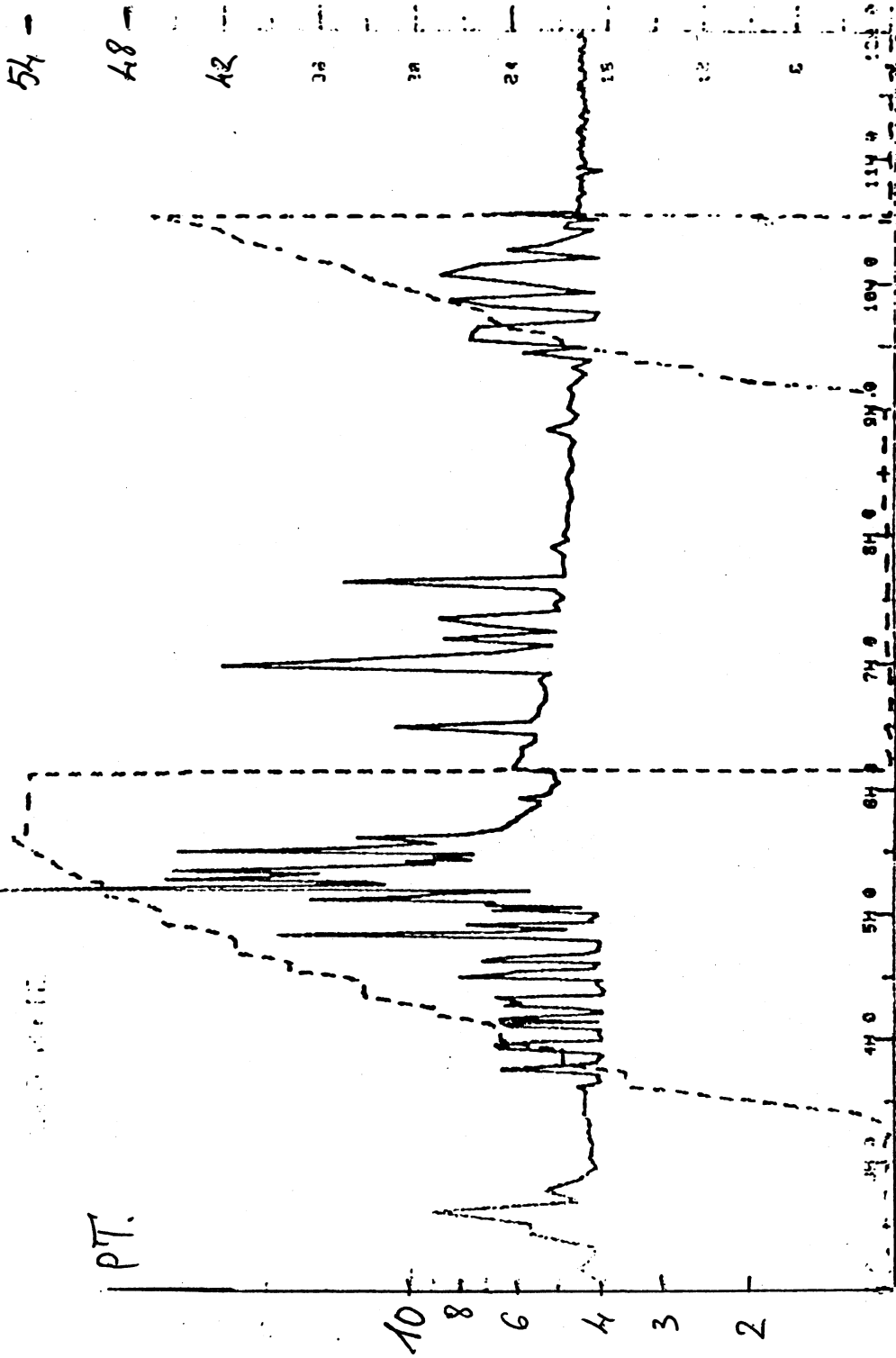


Figure 5