AK/ab

MPS/SR/MD 70-3
29. 6. 1970

# MD Note of 20. 6. 1970

## Fast Ejection on 3rd Turn

A further MD was made to study the possibility to eject during the 3rd revolution after kicker excitation. Computing the orbits of kicked bunches in the bump region around ss 58 it was seen that under the assumed conditions an ejection would be possible for $Q < 6.21$ and a mean radial beam position of $\sim +8$ mm. The computation also showed that even then losses on the down-stream end of septum 58 can occur (during 2nd turn). So the purpose of this MD was mainly to compare the theoretical results with the machine behaviour.

Conditions assumed for computing the orbits :

| | |
|---|---|
| Kick in ss 58 | = 21 mm |
| beam diameter in D sections | = 15 mm |
| septum position 58 | = + 54 mm |
| Q = 6.20; mean radial position | = + 10 mm equ. |

Conditions of experiment :

| | |
|---|---|
| $I_p$ | $\simeq 125 \times 10^{10}$ ppp |
| Momentum | = 19.2 GeV/c |
| Number of ejected bunches | = 5 |
| Ejection area | = 58 |
| Septum magnet position | = 54 mm |
| Kicker magnet voltage | = 51 kV on the lines |
| Mean radial position of the beam | = + 8.5 mm equ. for M = 207 |
| $I_{\text{bump coils}}$ | = 76 A |
| Q | $\approx$ 6.17 |
| Beam diameter in ss 24 | = 12 - 13 mm |

With kick IN (ejection on 1st turn) an ejection efficiency of 95 - 97 % was reached. Reversing the kicker field to kick OUT we observed losses in ss 58. After changing the septum angle from + 2 mrad to + 5 mrad, the losses were negligible and we reached an ejection efficiency of 95 - 97 %.

Figs. 1 and 2 show the theoretical and measured trajectories during the first and the second turn for the bump region 58. Fig. 3 shows the measured closed orbit.

Conclusions:

Without taking into account the real form of the closed orbit in the bump region (bump coils switched on) we could not hope to find the predicted parameters with good precision. Lack of time, difficulties with some measuring devices and instability of the machine made it impossible to check limits. However, under the above conditions an ejection during the 3rd turn as good as during the 2nd turn was made. Further MD sessions are necessary to confirm theoretical predictions for other parameters.

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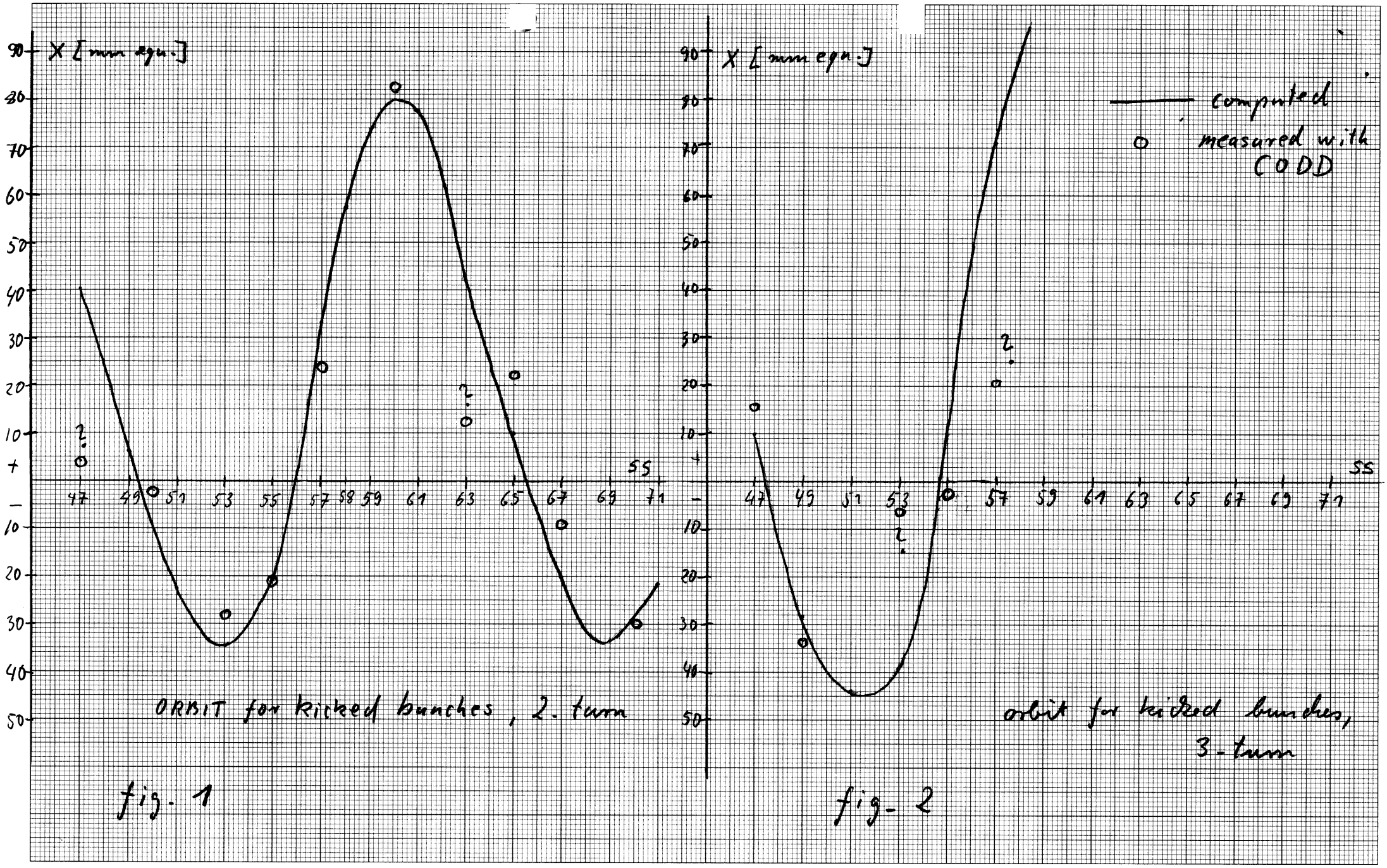


ORBIT for kicked bunches, 2. turn

fig. 1




orbit for kicked bunches, 3-turn

fig. 2

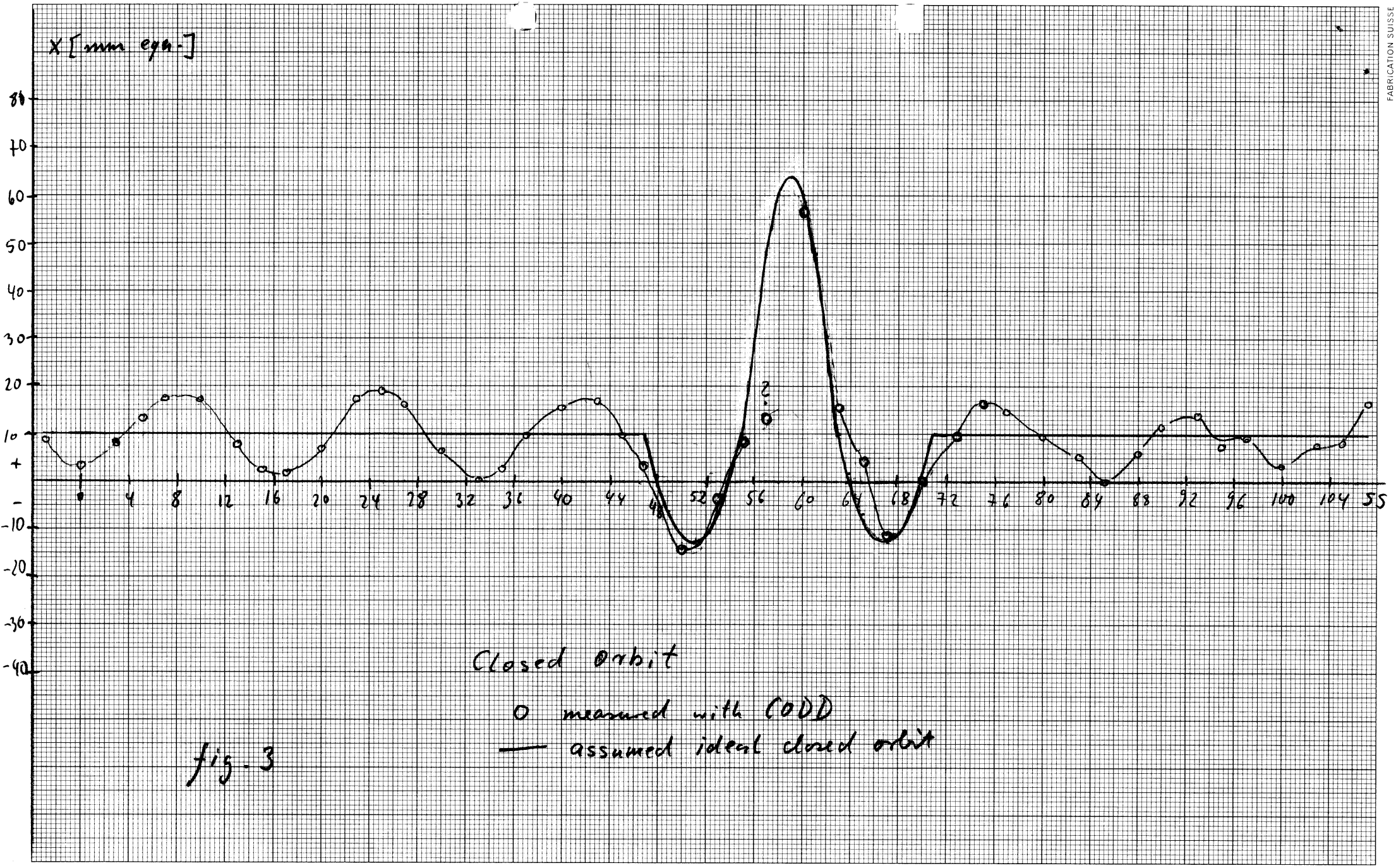


fig. 3