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MD RESULTS OF SEMGRID MEASUREMENTS

reported by

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Date : 13.8.1984 18h00 - 22h00.

Subject : Test and calibration of SEMGRID's MSG 258.268.278 (TT2) and MSG 2509 (AA Ejection Line).

After some problems with the synchronization to the proton test beam cycle (APTST) the beam profiles and emittances could be acquired and displayed by the SPS SEMGRID equipment, the GESPACK computer and the new software.

Figures 1 to 3 show the beam profiles by the SEMGRID's MSG 258, MSG 268, MSG 278 for test beams of about 3.E10 ppp (only 1 grid in the beam for low energy beams!).

The letters have the following meaning :

V = Vertical
H = Horizontal
W = Width (2 Sigma [mm])
P = Position (offset from center [mm])
S = Sum (beam intensity [ppp])
E = Emittance (estimated E.=(2*Sigma)^2/Beta)

EV = Vertical emittance [pi*mm*mrad]
EH = Horizontal Emittance "

AV = Vertical Alpha
AH = Horizontal Alpha

BV = Vertical Beta [m]
BH = Horizontal Beta [m]

} Ellipse Parameters

Later measurements with the SEMGrid's are presented in Figure 4 to 6. Figure 4 was obtained with a high intensity CT beam (∿ 2.E13 ppp).

Figures 5 and 6 belong to low intensity CT beams (2E12 ppp).

The accuracy of these emittance measurements could not be determined as no other (better) emittance informations were available.

The SEMGRID MSG 2509 in the AA Ejection line could not be tested as no beam passed through this line.

Figure 7 shows test signals with Gaussian profiles.

Figure 8 gives the MENU from which one of the 5 operations can be selected. All settings are done automatically to the corresponding operations (gains, betas, matrix parameters etc.) For the 3 first high energy operations 3 SEMGRID's are used simultaneously for the emittance measurement.

The low energy operations 4 and 5 still need the selection of the desired SEMGRID number as only one can be used at a time (blow up).

After the measurement and the display of the results the program comes back with the MENU presentation.

The transfer of the measured data to the NORD Computer via IDI (intelligent device interface) was also tested and worked correctly. The presentation on the console display could no more be checked due to lacking time.

Distribution (Open)

J. Bosser, SPS
L. Burnod, SPS

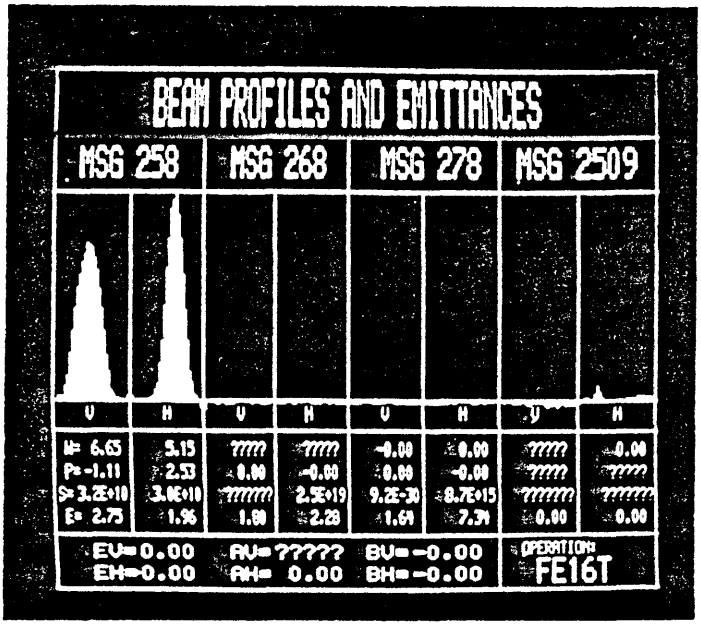

Fig.1

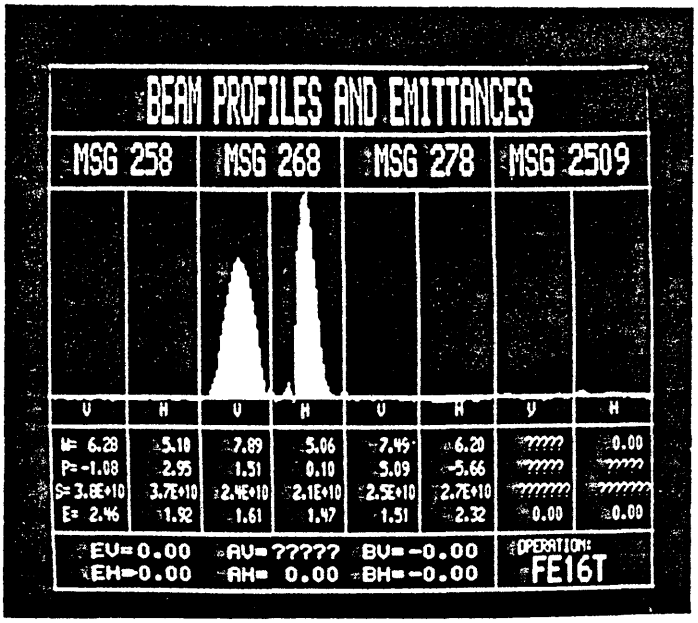

Fig.2

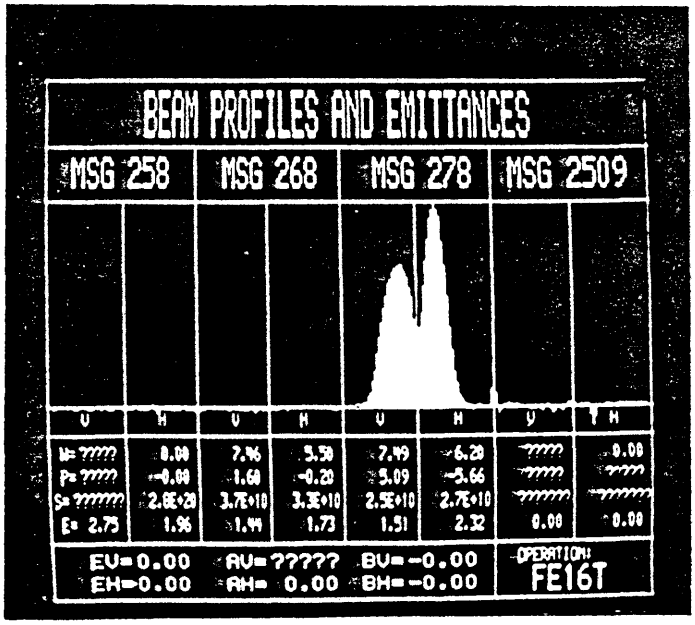

Fig.3

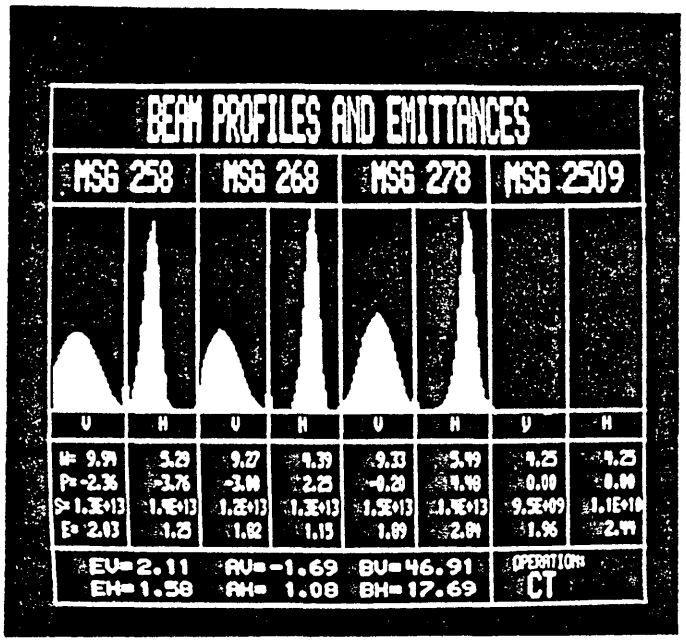

Fig.4

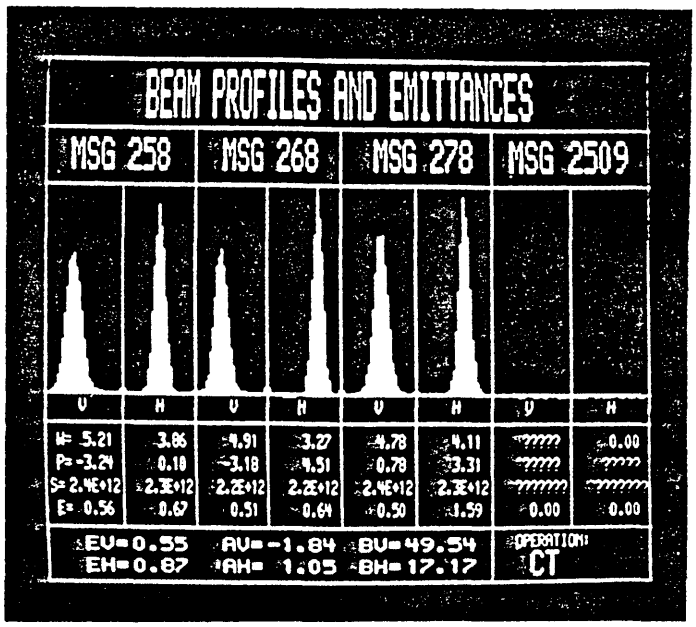

Fig.5

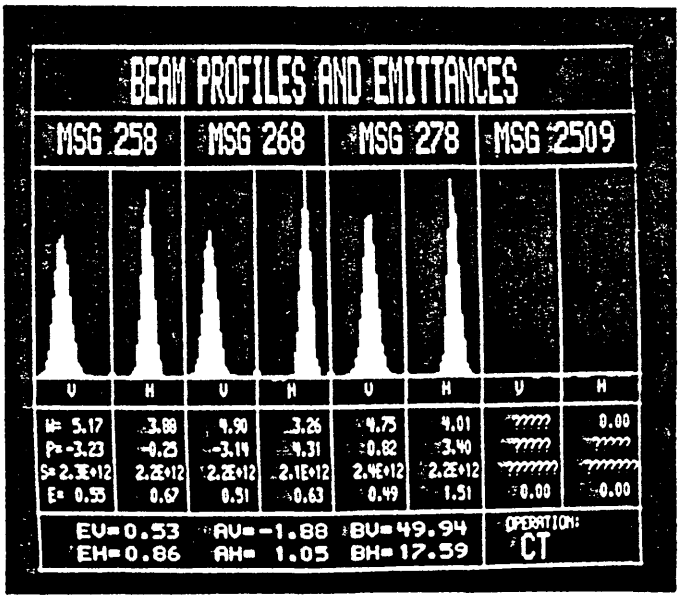

Fig.6

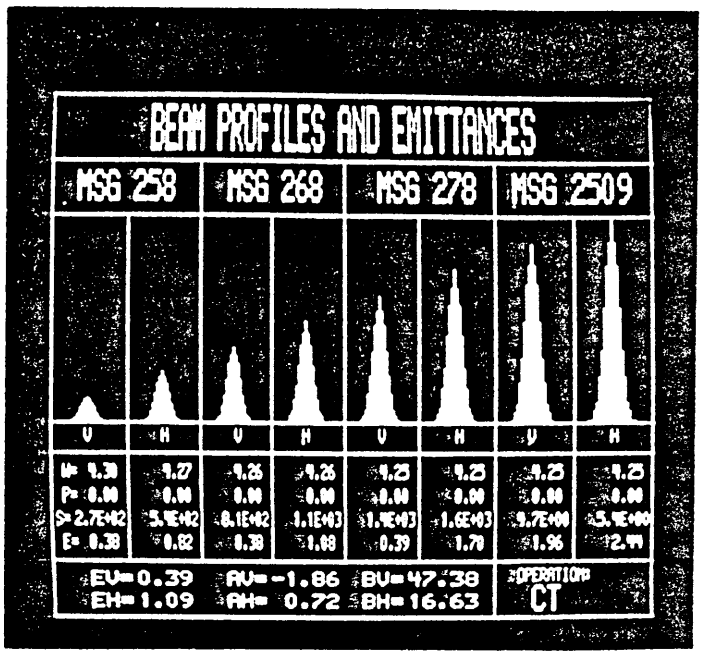
BEAM PROFILES AND EMITTANCES
MSG 258
MSG 268
MSG 278
MSG 2509
V
H
V
H
V
H
V
H
EV= 0.39
EH= 1.09
AV= -1.86
AH= 0.72
BV= 47.38
BH= 16.63
OPERATION
CT

Fig.7

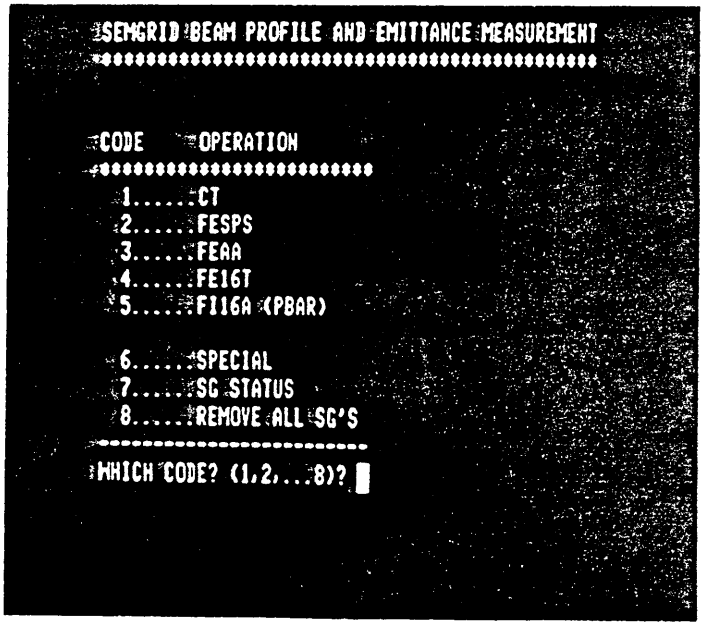
SEMGRID BEAM PROFILE AND EMITTANCE MEASUREMENT
CODE OPERATION
1.....CT
2.....FESPS
3.....FEAA
4.....FE16T
5.....F116A (PBAR)
6.....SPECIAL
7.....SG STATUS
8.....REMOVE ALL SG'S
WHICH CODE? (1,2,...8)?

Fig.8