12/30/86

Number 216

AGS Studies Report

Date(s) 10/27, 11/1, 11/11/86 Time(s) Various

Experimenter(s) W.K. van Asselt

Reported by W.K. van Asselt

Subject/Purpose The Working Line During Oxygen Acceleration

During the oxygen run in the fall of 1986, tune measurements were performed with the tune meter at several points early in the cycle. Because of the much lower frequencies involved, signal filtering and processing had to be done manually in the Main Control Room. In spite of the low intensity and the relative short pulse of the tune meter kickers, nice coherent signals could be produced.

Figure 1 shows the working line of the AGS during the heavy ion run at three different days with the following settings for the ν-quads.

	ν_H	ν_V
10/27/86	- 100	225
11/1/86	- 218	65
11/11/86	- 131	176

The arrows indicate the injection point (80 Gauss) and the last point of the curves represent measurements at 400 Gauss. The crosses indicate the working point of the bare machine at 400 Gauss, using numbers for the strengths of the ν-quads from Studies Report 213.

Figure 2 shows the calculated bare machine for these three cases as a function of field.

Apparently the machine is tuned in all cases to avoid hitting resonance lines (except for the less dangerous coupling resonance).

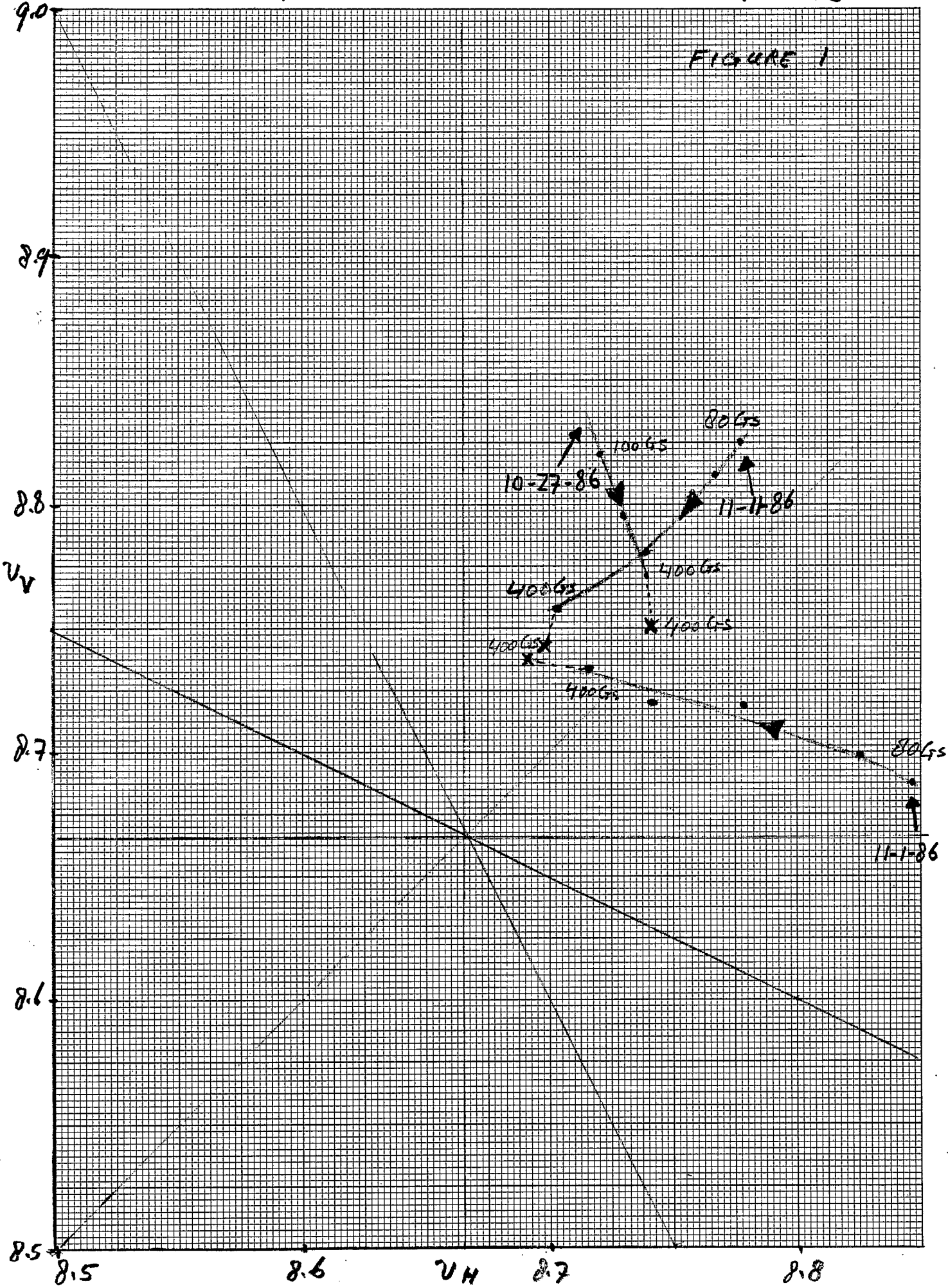
The measurements indicate a significant tune change from day to day. From manipulations with Lotus 1-2-3, the differences can not be accounted for by missing one or more of the power supplies of the ν-quads. Although the results are still unexplained, they indicate that in the future a more careful bookkeeping of relevant parameters

like cycle length, β-quads, high field quads, sextupoles, etc. Furthermore, the measurements should be performed before and after major changes of the magnetic cycle.

An additional hardware requirement is that we do have two PUE stations, half a betatron period from each other, to provide a reliable radial signal, because changing the orbit harmonics is one of the main parameters during heavy ion tuning, causing significant, but invisible, shift in the closed orbit.

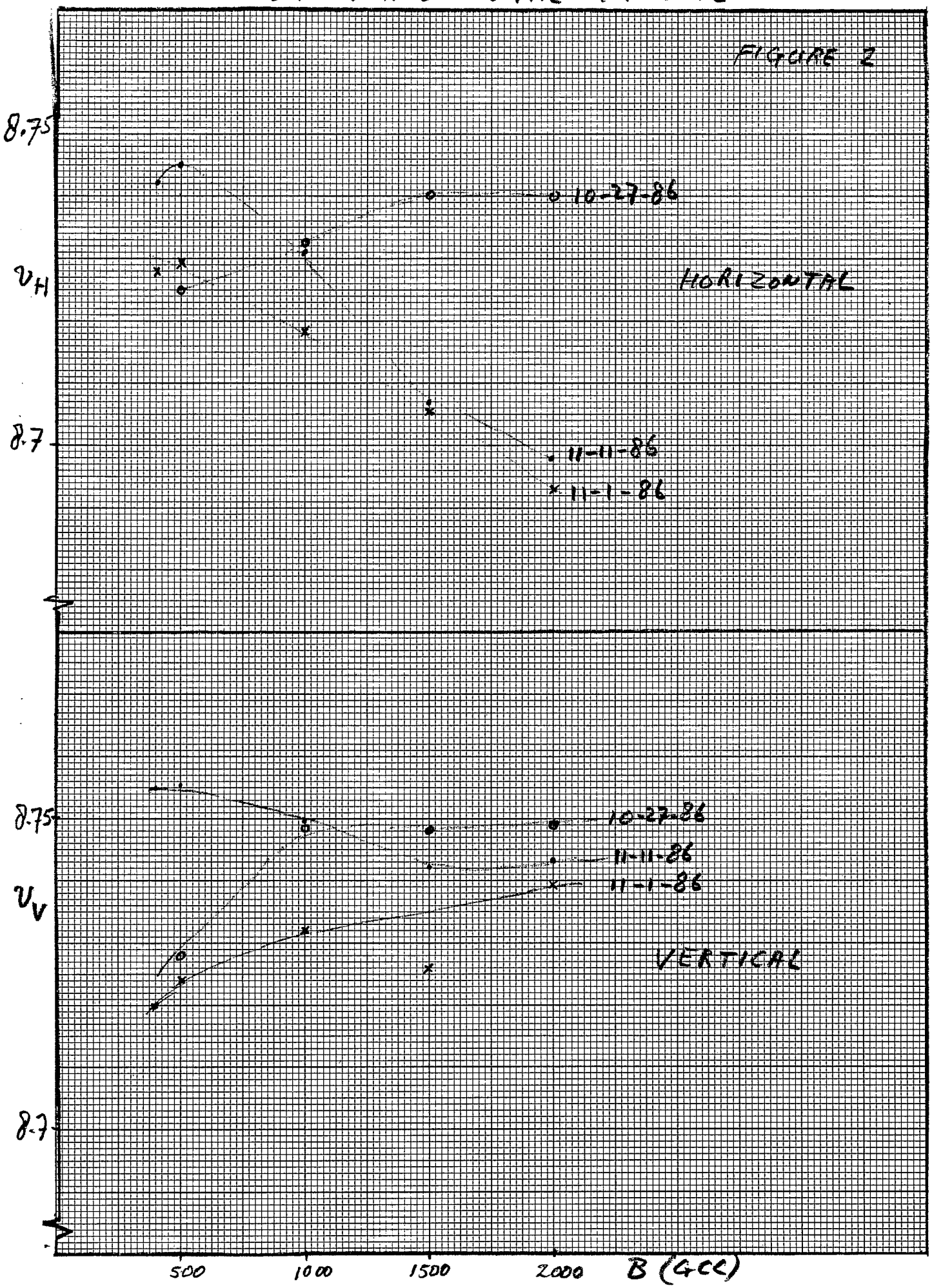
The PIP measurement of July, 1986 (Studies Report 213), furthermore only adds to the confusion.

WORKING LINE FROM 80 GS TO 400 GS



46 1320
K+E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CALCULATED BARE MACHINE



46 1320
K+E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.