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Magnetic Induction Mapping of TFTR Three Channel Deflection Magnet

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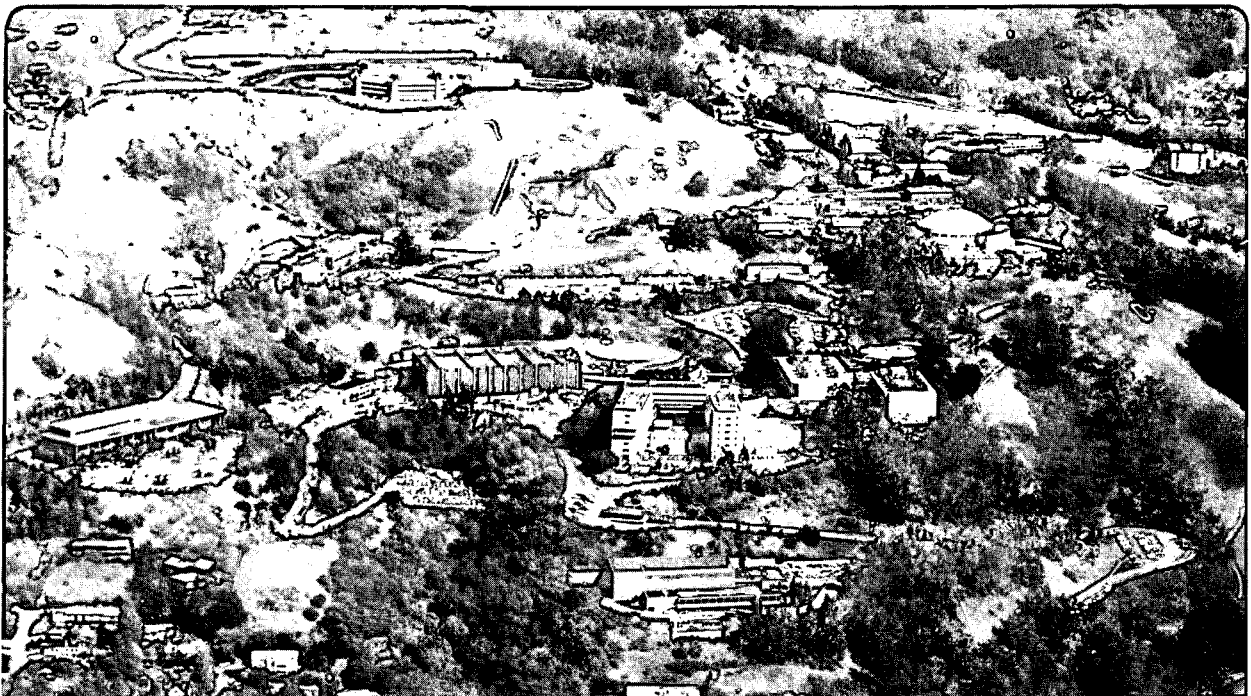
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SUBJECT

MAGNETIC INDUCTION MAPPING OF TFTR
THREE CHANNEL DEFLECTION MAGNET

NAME

Michael I. Green

DATE

June 29, 1979

Rev. A. 1/09/80

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IV. RESULTS AND DATA ANALYSISA. MAGNETIZATION CURVES

Figure 17 plots the magnetization curves $B(0,0,0)$ and the Hall Probe excitation curves for the left-hand-side and the center gaps. The B versus I data points for the two gaps were superimposed and reproduced each other except for slight hysteresis effects (typically under 1%). For currents up to 700 amps (2.2 kG), the magnetization curve is linear and can be expressed

$$B \text{ (Gauss)} = 3.132 \times I \text{ (amps)}.$$

The following relationships between magnetic induction and the Hall Probe outputs were determined by utilizing a linear least squares fit program on a TI-52 calculator.

Left-Hand-Side Gap

$$B \text{ (Gauss)} = mV_{HP 1} \times 23.57 - 26.4$$

$$B \text{ (Gauss)} = mV_{HP 2} \times 24.35 + 16.7$$

Center Gap

$$B \text{ (Gauss)} = mV_{HP 3} \times 23.12 - 141.9$$

$$B \text{ (Gauss)} = mV_{HP 4} \times 24.64 - 146.2$$

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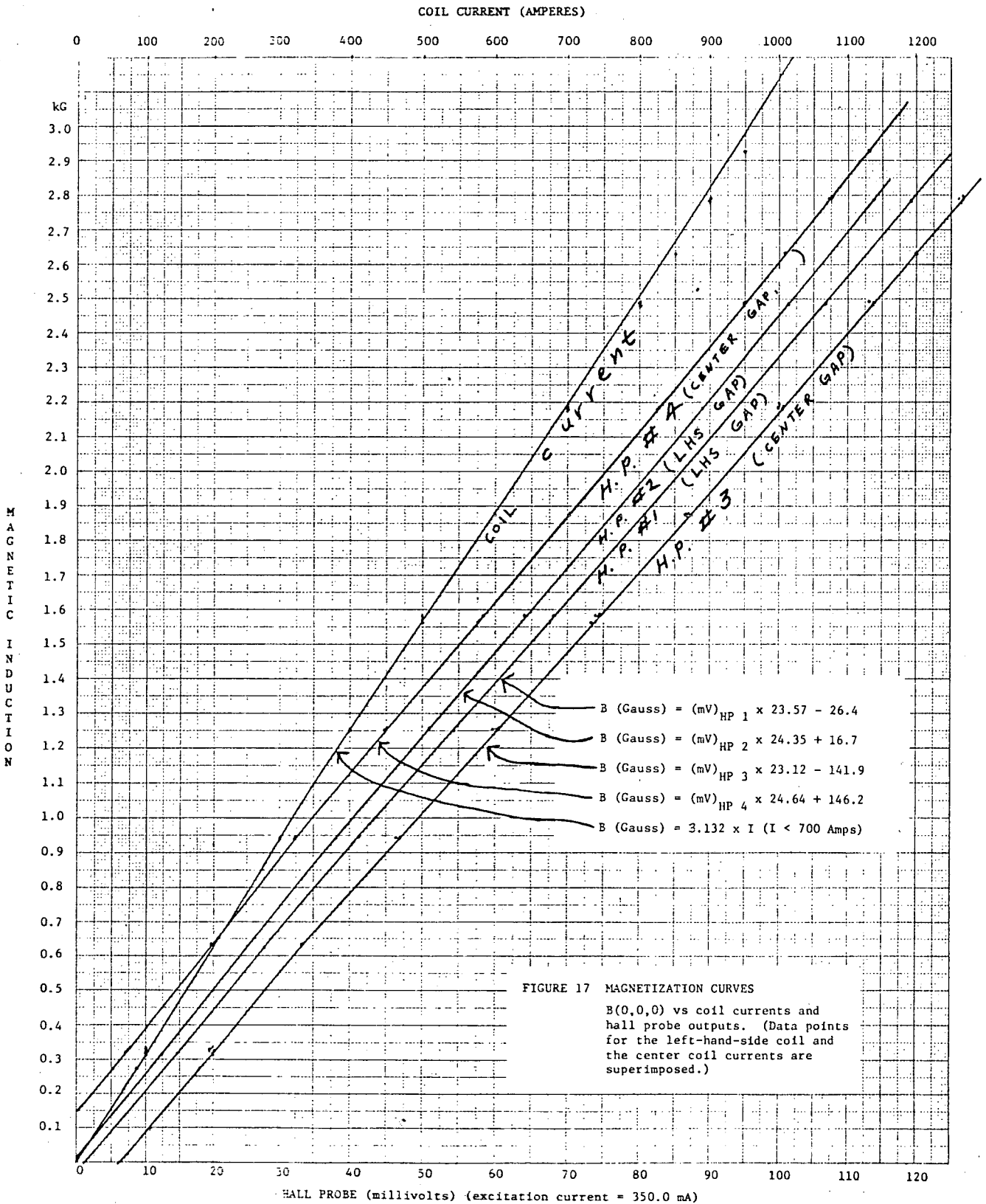


FIGURE 17 MAGNETIZATION CURVES
B(0,0,0) vs coil currents and hall probe outputs. (Data points for the left-hand-side coil and the center coil currents are superimposed.)

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