

RHIC Performance And The Choice Of The RF Frequency

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~~RHIC~~

RHIC-PG-45

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The attached graphs ~~and~~ indicate how the choice of the RF frequency, $h = 6 \times 57$ versus $h = 12 \times 57$ influences the intra-beam scattering and thus the RHIC performance.

Figure 2 shows that $h = 12 \times 57$ RF requires the voltage of $V = 2 \times 10^6$ compared to $V = 1 \times 10^6$ for $h = 6 \times 57$.

Figure 3 shows that the rms bunch length, σ_z in cms, at $\gamma = 100$ is

$$\begin{array}{ll} H = 6 \times 57 & \sigma_z = \del{110} 110 \text{ cms} \\ H = 12 \times 57 & \sigma_z = 70 \text{ cms} \end{array}$$

Figure 4 shows that $h = 12 \times 57$ RF leads to a somewhat larger emittance growth, due to the shorter bunch length, and about 10% smaller apertures than that found for $h = 6 \times 57$ RF.

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SQUARE 10 X 10 TO THE HALF INCH

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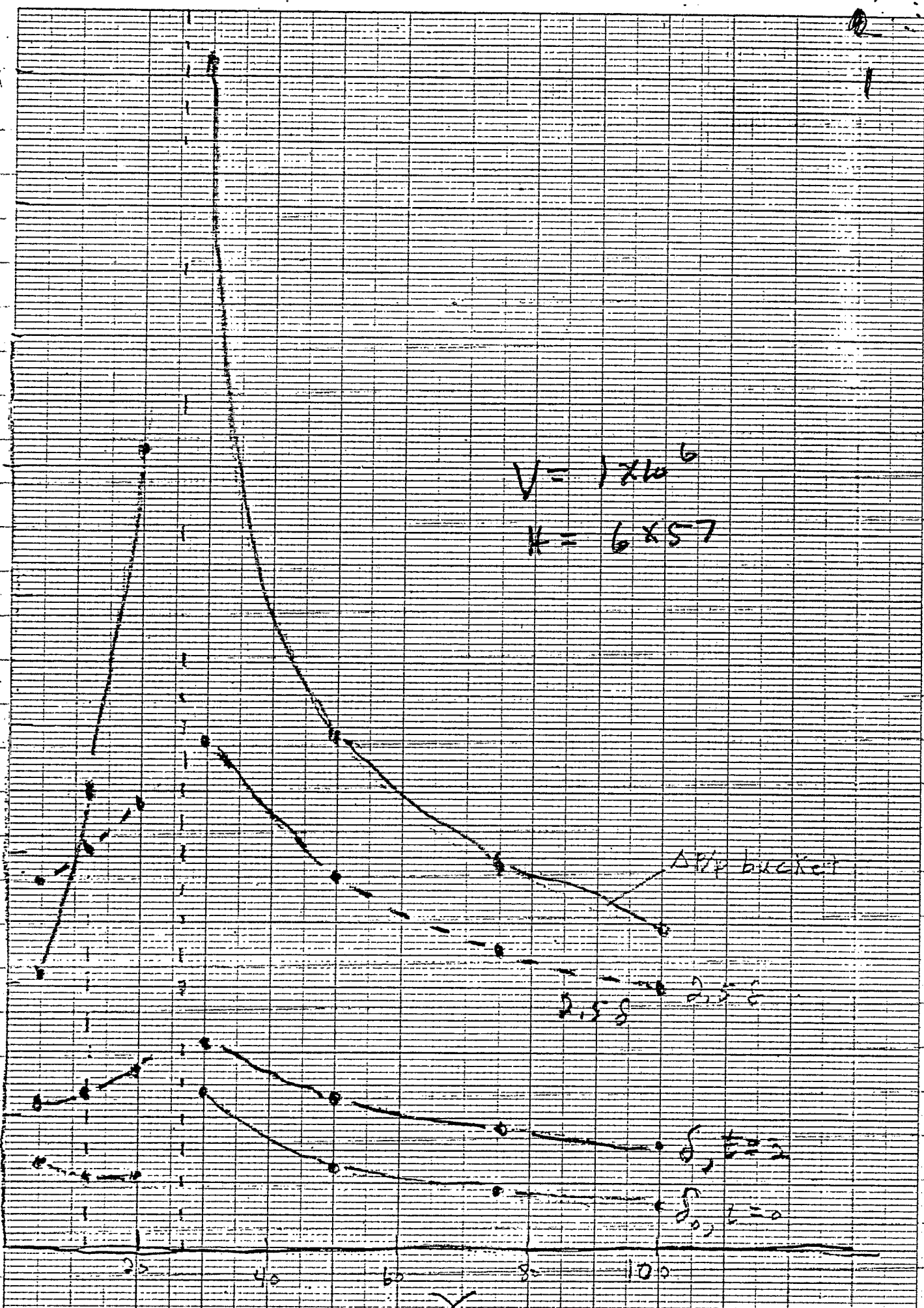
$V = 1 \times 10^6$
 $H = 6 \times 57$

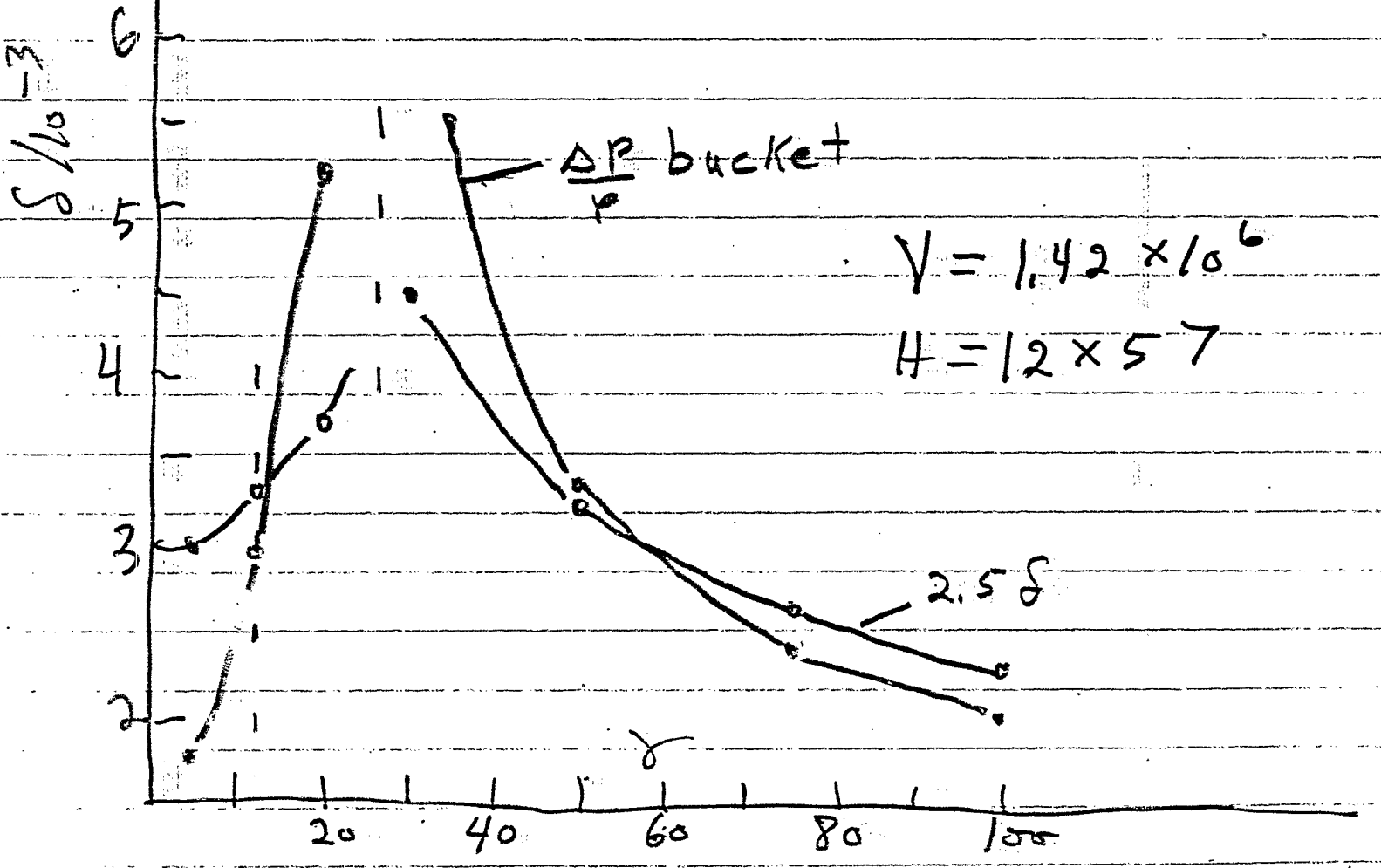
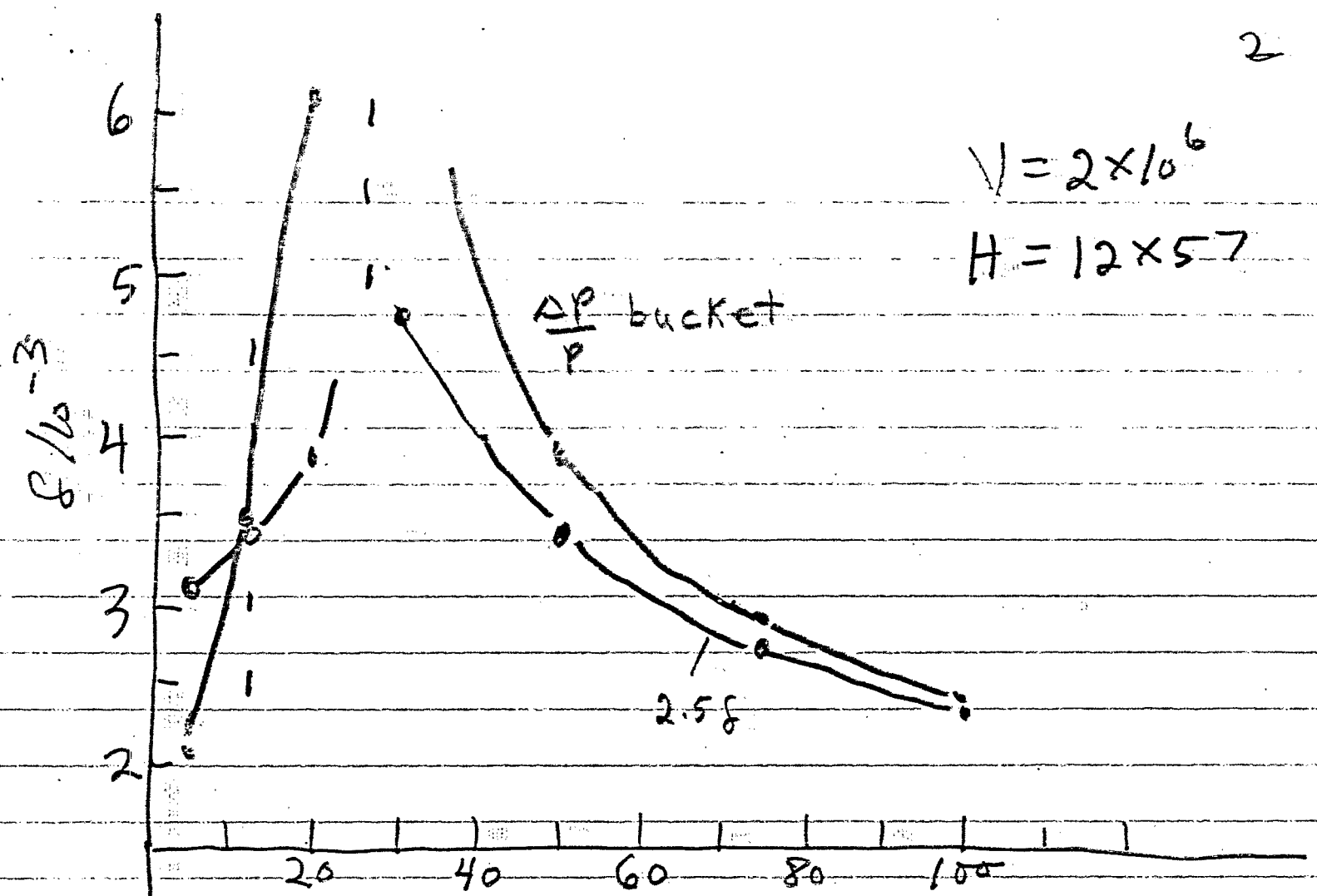
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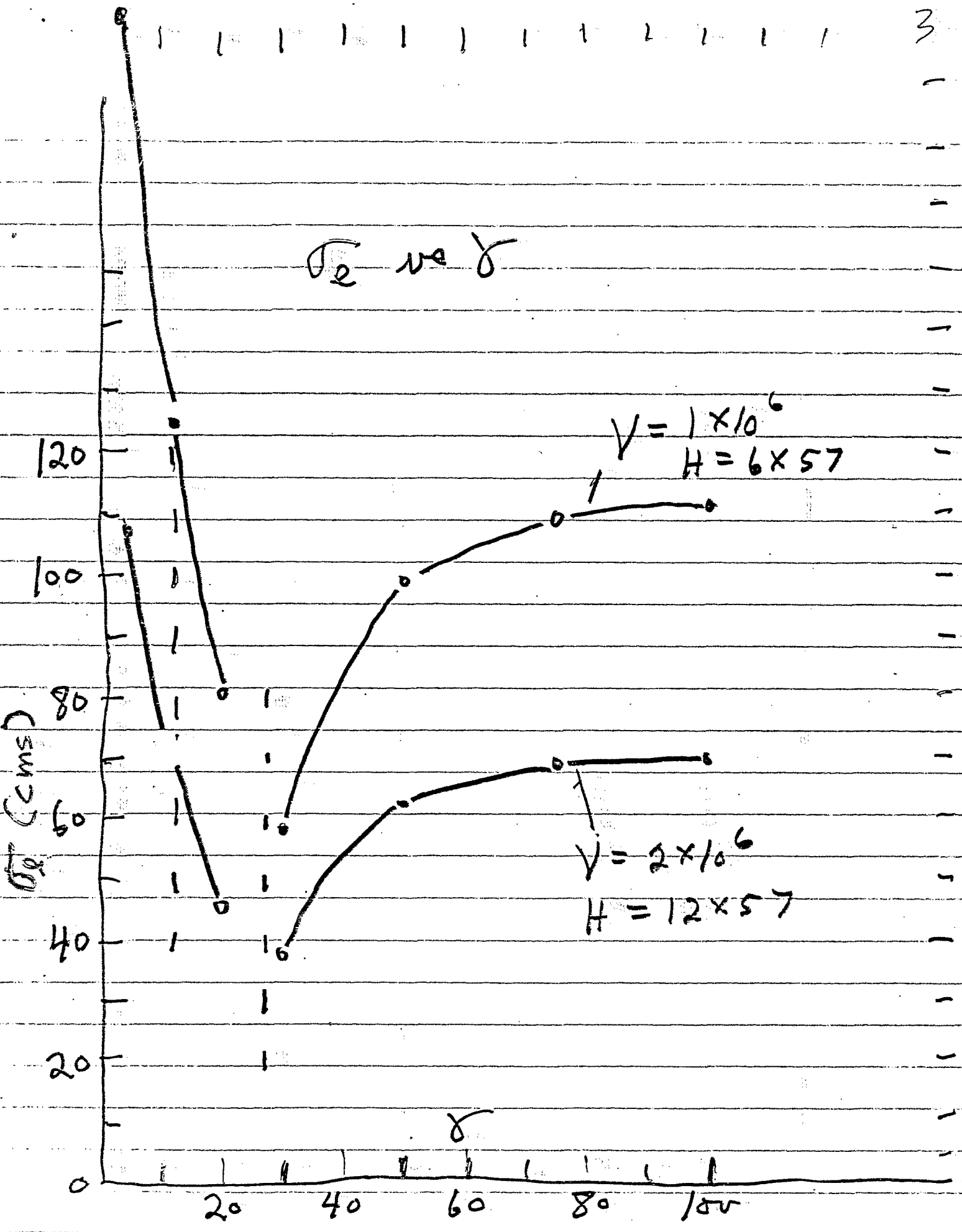
$\delta_1, t=2$

$\delta_0, t=0$





σ_e vs δ



$V = 1 \times 10^6$
 $H = 6 \times 57$

$V = 2 \times 10^6$
 $H = 12 \times 57$

σ_e (Cms)

δ

20 40 60 80 100

ϵ vs δ

