The total behavior due to the superposition of the effects of finite rise and relief waves would be as shown in Figure 5.2(c). This expectation has been supported by the experimental profiles obtained. See Figure 5.5. From these records a consistent means of obtaining the magnetization in the shocked, unrelieved material must be determined. A logical method would be to extrapolate the linear slope in Figure 5.2(c) back to zero time and accept this value of $\mathcal{E}$ as that required in Equation (5.5). Unfortunately, this is difficult to do consistently. This is especially true for the lower demagnetization shots where the signal to noise ratio was sufficiently low enough to frustrate a quantitative analysis of this kind.

The following is a description of the method used to analyze the experimental demagnetization data. Although less satisfying than that proposed in the last paragraph, this method yields a consistent and conservative description of the measurements. On every record there are distinct and well defined upper and lower bounds to the emf required in Equation (5.5) as shown in Figure 5.4. $\mathcal{E}_{min}$ is determined when approximately 70% of the full stress profile initially enters the medium. The 70% is obtained from a reverberation Hugoniot analysis at the solenoid grid. $\mathcal{E}_{max}$ incorporates the

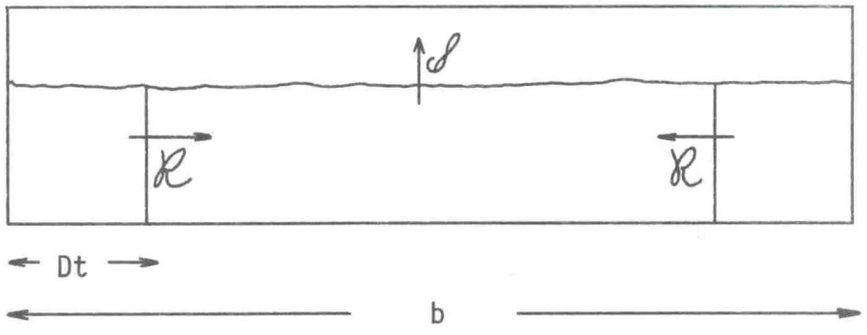


Fig. 5.3.--First approximation geometry of lateral relief wave behavior.

required emf plus the full effect of the lateral relief problem. Thus, one can safely assume that the required emf is

$$\mathcal{E}_{min} < \mathcal{E} < \mathcal{E}_{max}.$$

The procedure used here was to accept

$$\mathcal{E} = \frac{1}{2}(\mathcal{E}_{min} + \mathcal{E}_{max}) \qquad (5.8)$$

as the value required in Equation (5.5). The reported value for $\mathcal{E}$ was this average corrected for the moving pickup coil effect which approached 10% at the lowest demagnetization realized. The difference between $\mathcal{E}_{max}$ and $\mathcal{E}_{min}$ was accepted as error in the measurement. This was the dominant error.

## 5.4. Experimental Data

In Table 4, the experimental results of this work are presented in a form consistent with the discussion in the preceding three sections. Figure 5.5 gives the raw oscilloscope profiles resulting from the demagnetization during the first transit of the shock wave. The horizontal coordinate is time

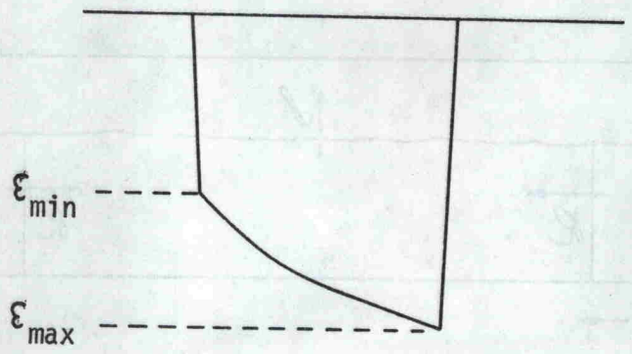


Fig. 5.4.--Emf extremes used in analyzing the demagnetization profile.