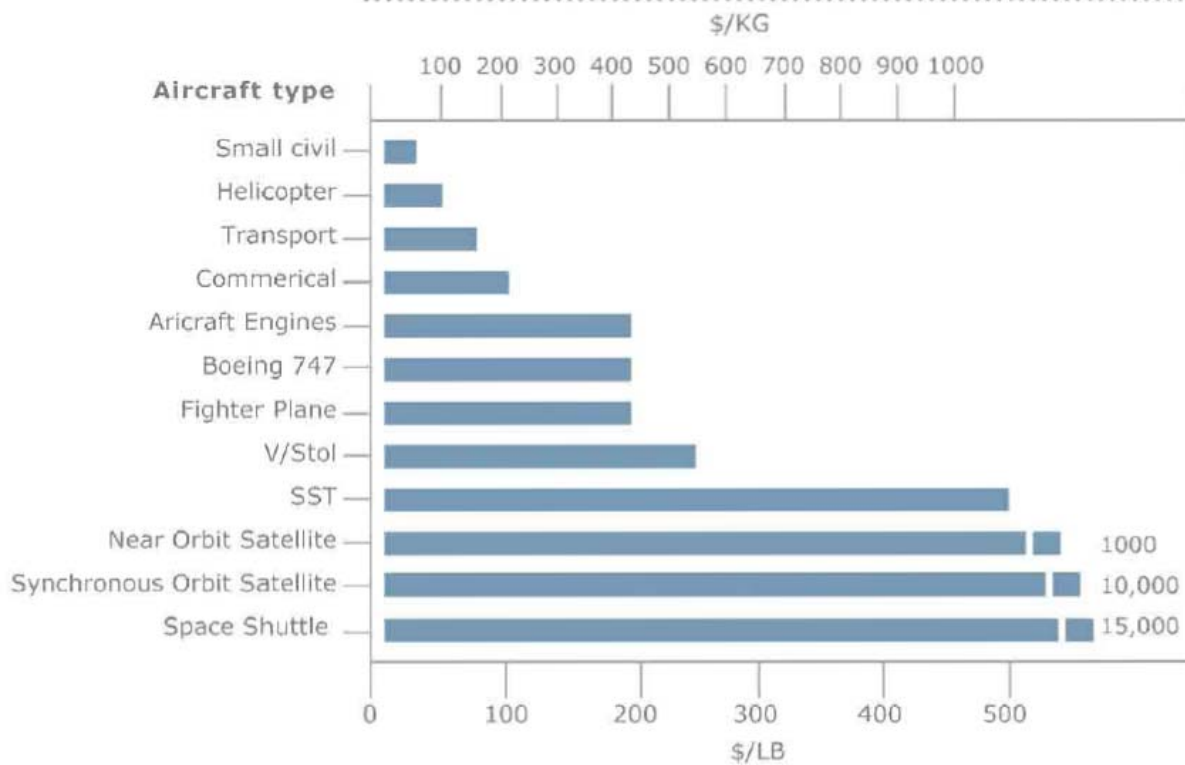
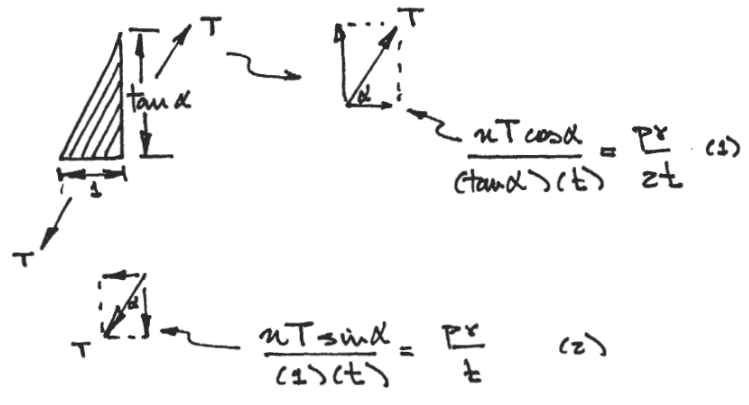
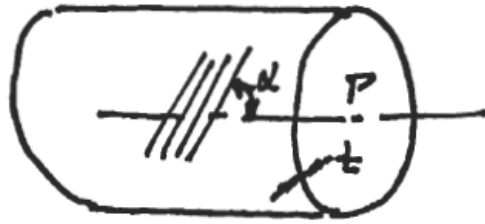


Value of weight saved in aircraft and spacecraft



网络理论—平衡模式

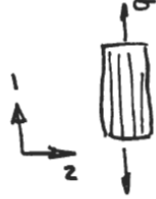


$$\frac{(2)}{(1)} \Rightarrow \frac{nT \sin \alpha \tan \alpha}{nT \cos \alpha} = \frac{Pr/t}{Pr/2t} = 2 \rightarrow \tan^2 \alpha = 2$$

$$\alpha = \text{Tan}^{-1} \sqrt{2} = 54.4^\circ$$

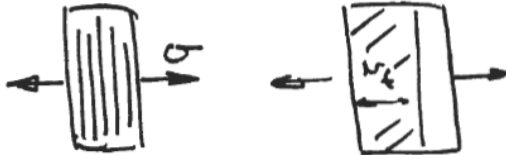
板材的微观力学

- 平行增强



$E_f = E_m = E$
 $P_f + P_m = P$
 $\sigma_f v_f + \sigma_m v_m = \sigma \quad (1)$
 $\sigma = P/A = P$
 $\rightarrow 1 \quad 1 \leftarrow$
 $v_f \quad 1-v_f$
 $\div E$
 $E_f v_f + E_m v_m = E_1$

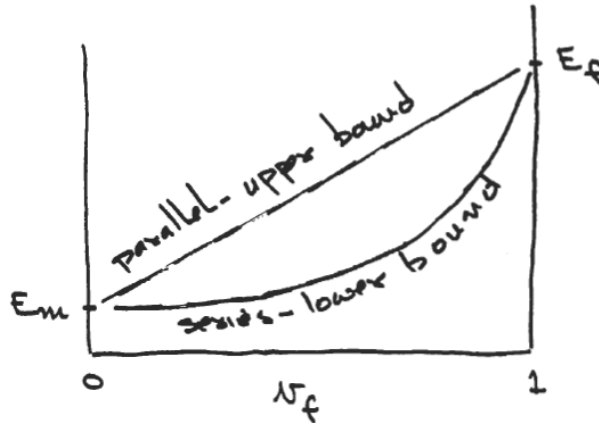
- 各向增强



$$P_f = P_m = P$$

$$\delta_f + \delta_m = \delta$$

$$\frac{1}{E_2} = \frac{v_f}{E_f} + \frac{v_m}{E_m}$$



Halpin-Tsal

$$E_2 = E_m \frac{1 + \xi \eta v_f}{1 - \eta v_f}$$

$$\eta = \frac{\left(\frac{E_f}{E_m} - 1\right)}{\left(\frac{E_f}{E_m} + \xi\right)}$$

$\xi = \xi$ (几何堆积)

- 强度——假定 $\varepsilon_{b,m} > \varepsilon_{b,f}$

因为当 $\varepsilon = \varepsilon_{b,f}$ 时, 出现断裂

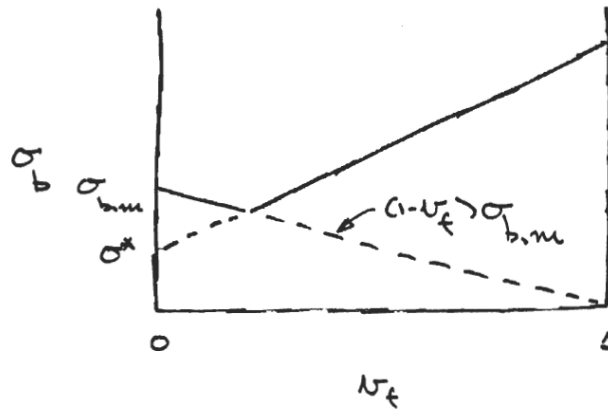
$$E_1 = \nu_f E_f + \nu_m E_m$$

$x\varepsilon$:

$$\sigma_b = \varepsilon_{b,f} = \nu_f \sigma_{b,f} + (1 - \nu_f) \sigma^*$$

$$\sigma^* = \text{基体应力} = \varepsilon_{b,f} E_m$$

$$\sigma_{b,f} = E_1 \varepsilon_{b,f}$$



$$\sigma_{b,m} = E_m \varepsilon_{b,m} = (\text{基体断裂强度})$$