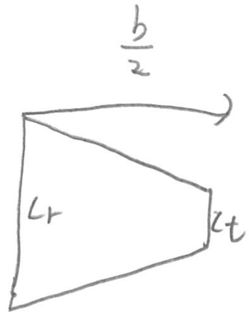
令 $\lambda = \frac{C_t}{C_r}$

$$S = \frac{b}{2}(C_r + C_t) = \frac{b}{2} C_r\left(1 + \frac{C_t}{C_r}\right) = \frac{b}{2} C_r(1+\lambda)$$

$$C(y) = C_r + (C_t - C_r)\frac{2}{b}y = C_r\left(1 - \frac{2(1-\lambda)}{b}y\right)$$

$$\overline{C}_{mac} = \frac{2}{S}\int_0^{\frac{b}{2}} (C(y))^2\, dy$$




$\boxed{\text{aside}}$ $$C_r^2\left(1 - \frac{2(1-\lambda)}{b}y\right)^2$$

$$= C_r^2\left(1 - \frac{4(1-\lambda)}{b}y + \frac{4(1-\lambda)^2}{b^2}y^2\right)$$

$$\overline{C}_{mac} = \frac{2}{S}\int_0^{\frac{b}{2}} C_r^2\left(y - \frac{4(1-\lambda)}{2b}y^2 + \frac{4(1-\lambda)^2}{3b^2}y^3\right) dy$$

$$= \frac{2}{S}\int_0^{\frac{b}{2}} C_r^2 y\left(1 - \frac{4(1-\lambda)}{2b}y + \frac{4(1-\lambda)^2}{3b^2}y^2\right) dy$$

$$= \frac{2}{S}\left(C_r^2 \frac{b}{2}\left(1 - \frac{4(1-\lambda)}{2b}\frac{b}{2} + \frac{4(1-\lambda)^2}{3b^2}\frac{b^2}{4}\right)\right)$$

$$= \frac{2}{S}\left(C_r^2 \frac{b}{2}\left(1 - \cancel{(1-\lambda)}^{\lambda} + \frac{(1-\lambda)^2}{3}\right)\right)$$

$1^2 - 2\lambda + \lambda^2$

$$= \frac{\cancel{2}}{S}\left(C_r^2 \frac{b}{2}\left(\frac{1+\lambda+\lambda^2}{3}\right)\right)$$

$$= \frac{C_r}{2S} b \cdot \frac{2}{3}\left(\frac{1+\lambda+\lambda^2}{3}\right)C_r = \frac{2}{3}\left(\frac{1+\lambda+\lambda^2}{1+\lambda}\right)C_r \quad \#$$

$\because\ S = \frac{b}{2}(C_r(1+\lambda))$ $$\frac{C_r \cancel{b}}{\cancel{b}(C_r(1+\lambda))}$$