

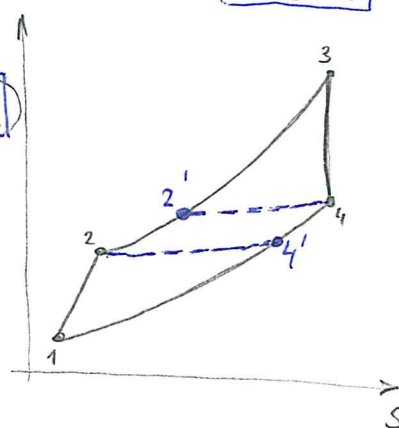
$$\eta_r = \frac{T_2' - T_2}{T_4 - T_2} = \frac{T_4 - T_2 - (T_4 - T_2')}{T_4 - T_2} = 1 - \frac{T_4 - T_2'}{T_4 - T_2} = 1 - \frac{T_4 - T_2}{T_4 - T_2} \cdot \frac{T_4 - T_2'}{T_4 - T_2} = 1 - \frac{T_4 - T_2'}{T_4 - T_2}$$

$$T_2' : (T_4 - T_2) \cdot \eta_r = (T_4 - T_2) - (T_4 - T_2')$$

$$T_2' = T_2 + (T_4 - T_2) \cdot \eta_r$$

$$T_4' : (T_4 - T_2) \cdot \eta_r = (T_4 - T_2) - (T_4' - T_2)$$

$$T_4' = T_4 - (T_4 - T_2) \cdot \eta_r$$



$$\eta_t = 1 - \frac{q_{out}}{q_{in}} = 1 - \frac{c_p \cdot (T_4' - T_1)}{c_p \cdot (T_3 - T_2')} = 1 - \frac{[T_4 - (T_4 - T_2) \cdot \eta_r] - T_1}{T_3 - [T_2 + (T_4 - T_2) \cdot \eta_r]} =$$

$$= \frac{(T_3 - T_2) - (T_4 - T_2) \cdot \eta_r - (T_4 - T_1) + (T_4 - T_2) \cdot \eta_r}{(T_3 - T_2) - (T_4 - T_2) \cdot \eta_r} = \frac{(T_3 - T_4) - (T_2 - T_1)}{(T_3 - T_4) - (T_2 - T_1) + \eta_r [(T_3 - T_4) - (T_3 - T_1) + (T_2 - T_1)]}$$

$$= \frac{T_3 (1 - \eta_r^m) \cdot \eta_s^T - T_1 (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k}}{T_1 (T_3 - T_1) \cdot (1 - \eta_r) - \frac{T_1}{\eta_s^k} (T_2 - T_1) \cdot (1 - \eta_r) + \eta_r \frac{T_3}{\eta_s^k} (T_3 - T_4) \cdot \eta_s^T}$$

$$= \frac{T_3 (1 - \eta_r^m) \cdot \eta_s^T - T_1 (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k}}{T_1 (\eta_r - 1) \cdot (1 - \eta_r) - T_1 (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \cdot (1 - \eta_r) + T_3 \cdot \eta_r (1 - \eta_r^m) \cdot \eta_s^T}$$

$$= \frac{T_1 \cdot \left[\frac{T_3}{T_1} \cdot (1 - \eta_r^m) \cdot \eta_s^T - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \right]}{T_1 \left[(\eta_r - 1) \cdot (1 - \eta_r) - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \cdot (1 - \eta_r) + \frac{T_3}{T_1} \cdot \eta_r (1 - \eta_r^m) \cdot \eta_s^T \right]}$$

$$= \frac{\eta_r (1 - \eta_r^m) \cdot \eta_s^T - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k}}{\eta_r (1 - \eta_r) - (1 - \eta_r) - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \cdot (1 - \eta_r) + \eta_r \cdot \eta_r (1 - \eta_r^m) \cdot \eta_s^T}$$

$$= \frac{\eta_r (1 - \eta_r^m) \cdot \eta_s^T - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k}}{\eta_r - \eta_r \eta_r - (1 - \eta_r) \cdot \left[1 + (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \right] + \eta_r \cdot \eta_r (1 - \eta_r^m) \cdot \eta_s^T}$$

$$= \frac{\eta_r (1 - \eta_r^m) \cdot \eta_s^T - (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k}}{\eta_r - (1 - \eta_r) \cdot \left[1 + (\eta_r^m - 1) \cdot \frac{1}{\eta_s^k} \right] - \eta_r \cdot \eta_r \cdot \left[1 - (1 - \eta_r^m) \cdot \eta_s^T \right]}$$