POD 15

$$q_{12} = \frac{\sigma(T_1^4 - T_2^4)}{\frac{1}{e_1} + \frac{1}{e_2} - 1} = \frac{\sigma(T_1^4 - T_2^4)}{\frac{2}{e} - 1}$$

so $T_2^4 = -\left(\frac{2}{e} - 1\right)\frac{q_{12}}{\sigma} + T_1^4$

If we have n layers

$$q = \frac{\sigma(T_1^4 - T_n^4)}{(n-1)\left(\frac{2}{e} - 1\right)} = q_{12}$$

$$\therefore\ T_{i+1}^4 = T_i^4 - \frac{(T_1^4 - T_n^4)}{n-1}$$

In space we also have the final layer emitting at $q = \cancel{e}\sigma T_n^4$ w/ no back radiation

$$\therefore\ e\cancel{\sigma} T_n^4 = \frac{\cancel{\sigma}(T_1^4 - T_n^4)}{(n-1)\left(\frac{2}{e} - 1\right)}$$

$$(n-1)\,e\left(\frac{2}{e} - 1\right) T_n^4 + T_n^4 = T_1^4$$

$$T_n^4\left((n-1)(2 - e) + 1\right) = T_1^4$$

$$T_n = T_1\left(\frac{1}{(1 + (2-e)(n-1))}\right)^{1/4}$$

so if $e = 0.04$, $n = 5$

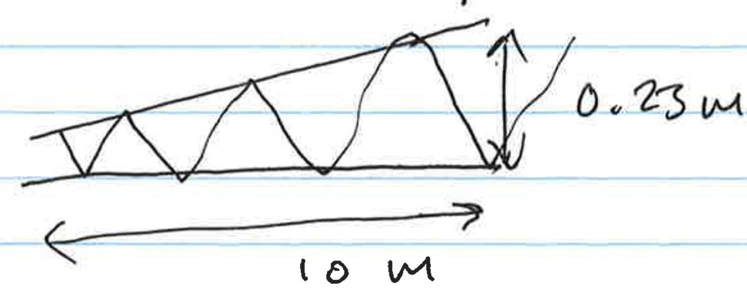
$$T_n = T_1 \left(\frac{1}{1+8-4e} \right)^{1/4} \simeq T_1 \frac{1}{\sqrt{3}}$$

$T_1 = 383°K$

$T_5 = 221°K$ which matches their description. (max temp of layer 5)

This isn't good enough - which is why it's curved & open at edges!

Angle is ~ ~~..~~ .9" spread over ~10 m



so because $e \sim 0.04$ bounces ~ 25 times before absorbed

Thus the flux between each layer is reduced (some heat leaks out edge)

They report min. temp of layer 5 is 36°K