Radiation Balance between parallel plates

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Question 1

$\beta_1 = (1 - \varepsilon_1) \cdot h$

$\beta_2 = (1 - \varepsilon_2) \cdot h$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 & -\frac{1}{2} \cdot \beta_1 \cdot f(x_0,y_0,d) & -\beta_1 \cdot f(x_0,y_1,d) & -\beta_1 \cdot f(x_0,y_2,d) & -\beta_1 \cdot f(x_0,y_3,d) & -\frac{1}{2} \cdot \beta_1 \cdot f(x_0,y_4 \\ 0 & 1 & 0 & 0 & 0 & -\frac{1}{2} \cdot \beta_1 \cdot f(x_1,y_0,d) & -\beta_1 \cdot f(x_1,y_1,d) & -\beta_1 \cdot f(x_1,y_2,d) & -\beta_1 \cdot f(x_1,y_3,d) & -\frac{1}{2} \cdot \beta_1 \cdot f(x_1,y_4 \\ 0 & 0 & 1 & 0 & 0 & -\frac{1}{2} \cdot \beta_1 \cdot f(x_2,y_0,d) & -\beta_1 \cdot f(x_2,y_1,d) & -\beta_1 \cdot f(x_2,y_2,d) & -\beta_1 \cdot f(x_2,y_3,d) & -\frac{1}{2} \cdot \beta_1 \cdot f(x_2,y_4 \\ 0 & 0 & 0 & 1 & 0 & -\frac{1}{2} \cdot \beta_1 \cdot f(x_3,y_0,d) & -\beta_1 \cdot f(x_3,y_1,d) & -\beta_1 \cdot f(x_3,y_2,d) & -\beta_1 \cdot f(x_3,y_3,d) & -\frac{1}{2} \cdot \beta_1 \cdot f(x_3,y_4 \\ 0 & 0 & 0 & 0 & 1 & -\frac{1}{2} \cdot \beta_1 \cdot f(x_4,y_0,d) & -\beta_1 \cdot f(x_4,y_1,d) & -\beta_1 \cdot f(x_4,y_2,d) & -\beta_1 \cdot f(x_4,y_3,d) & -\frac{1}{2} \cdot \beta_1 \cdot f(x_4,y_4 \end{pmatrix} \tag{1}$$

$$\begin{pmatrix} -\frac{1}{2} \cdot \beta_2 \cdot f(x_0,y0,d) & -\beta_2 \cdot f(x_1,y_0,d) & -\beta_2 \cdot f(x_2,y_0,d) & -\beta_2 \cdot f(x_4,y_0,d) & -\frac{1}{2} \cdot \beta_2 \cdot f(x_4,y_0,d) & 1 & 0 & 0 \\ -\frac{1}{2} \cdot \beta_2 \cdot f(x_0,y_1,d) & -\beta_2 \cdot f(x_1,y_1,d) & -\beta_2 \cdot f(x_2,y_1,d) & -\beta_2 \cdot f(x_4,y_1,d) & -\frac{1}{2} \cdot \beta_2 \cdot f(x_4,y_1,d) & 0 & 1 & 0 \\ -\frac{1}{2} \cdot \beta_2 \cdot f(x_0,y_2,d) & -\beta_2 \cdot f(x_1,y_2,d) & -\beta_2 \cdot f(x_2,y_2,d) & -\beta_2 \cdot f(x_4,y_2,d) & -\frac{1}{2} \cdot \beta_2 \cdot f(x_4,y_2,d) & 0 & 0 & 1 \\ -\frac{1}{2} \cdot \beta_2 \cdot f(x_0,y_3,d) & -\beta_2 \cdot f(x_1,y_3,d) & -\beta_2 \cdot f(x_2,y_3,d) & -\beta_2 \cdot f(x_4,y_3,d) & -\frac{1}{2} \cdot \beta_2 \cdot f(x_4,y_3,d) & 0 & 0 & 0 \\ -\frac{1}{2} \cdot \beta_2 \cdot f(x_0,y0_4,d) & -\beta_2 \cdot f(x_1,y_4,d) & -\beta_2 \cdot f(x_2,y_4,d) & -\beta_2 \cdot f(x_4,y_4,d) & -\frac{1}{2} \cdot \beta_2 \cdot f(x_4,y_4,d) & 0 & 0 & 0 \end{pmatrix} \tag{2}$$

$$\begin{pmatrix} u_0 \\ u_1 \\ u_2 \\ u_3 \\ u_4 \\ v_0 \\ v_1 \\ v_2 \\ v_3 \\ v_4 \end{pmatrix} \tag{3}$$

$$\begin{pmatrix} \varepsilon_1 \sigma T_1^4 \\ \varepsilon_1 \sigma T_1^4 \\ \varepsilon_1 \sigma T_1^4 \\ \varepsilon_1 \sigma T_1^4 \\ \varepsilon_1 \sigma T_1^4 \\ \varepsilon_2 \sigma T_2^4 \\ \varepsilon_2 \sigma T_2^4 \\ \varepsilon_2 \sigma T_2^4 \\ \varepsilon_2 \sigma T_2^4 \\ \varepsilon_2 \sigma T_2^4 \end{pmatrix} \tag{4}$$

Question 2

Question 3