WEEK 1.2 Friday project

$$h_{ice} = \sqrt{\underbrace{\frac{2K_{ice}}{\rho_{ice} L}}_{f} \underbrace{\Delta T \Delta t}} + h_0^2 = \left[f \cdot \Delta T \Delta t + h_0^2 \right]^{1/2}$$

$$\frac{\partial h_{ice}}{\partial \Delta T} = \frac{1}{2}\left[f \cdot \Delta T \Delta t + h_0^2 \right]^{-1/2} \cdot f \Delta t$$

$$\frac{\partial^2 h_{ice}}{\partial^2 \Delta T} = \frac{f \Delta t}{2} \cdot \left[\frac{-1}{2}\right]\left[f \cdot \Delta T \Delta t + h_0^2 \right]^{-3/2} f \cdot \Delta t$$

$$= -\frac{f^2 \Delta t^2}{4}\left[f \cdot \Delta T \Delta t + h_0^2 \right]^{-3/2}$$

$$\frac{\partial h_{ice}}{\partial h_0} = \frac{1}{2}\left[f \cdot \Delta T \Delta t + h_0^2 \right]^{-1/2} 2 h_0 = h_0 \left[\quad \right]^{-1/2}$$

$$\frac{\partial^2 h_{ice}}{\partial h_0^2} = \left[f \Delta T \Delta t + h_0^2 \right]^{-1/2} + h_0 \left[\frac{-1}{2}\right]\left[f \Delta T \Delta t + h_0^2 \right]^{-3/2} 2 h_0$$

$$= \left[f \Delta T \Delta t + h_0^2 \right]^{-1/2} - h_0^2 \left[f \Delta T \Delta t + h_0^2 \right]^{-3/2}$$