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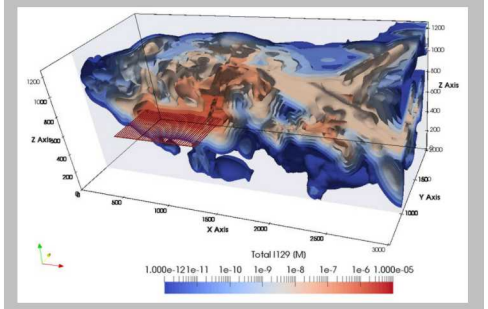
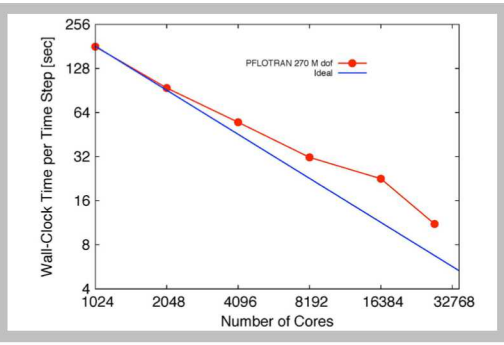
$$\frac{\partial m_a}{\partial t} = -\nabla \cdot \left(\rho_l X_a^l \boldsymbol{q}_l + \rho_g X_a^g \boldsymbol{q}_g + \boldsymbol{J}_a^l + \boldsymbol{J}_a^g\right) + q_a^G,$$
$$\frac{\partial m_w}{\partial t} = -\nabla \cdot \left(\rho_l X_w^l \boldsymbol{q}_l + \rho_g X_w^g \boldsymbol{q}_g + \boldsymbol{J}_w^l + \boldsymbol{J}_w^g\right) + q_w^G,$$
$$\frac{\partial e}{\partial t} = -\nabla \cdot \left(\rho_l H_l \boldsymbol{q}_l + \rho_g H_g \boldsymbol{q}_g - \kappa_{\text{eff}} \nabla T\right) + q_e^G,$$





PFLOTRAN Short Course Goals

U.S. DEPARTMENT OF ENERGY
National Nuclear Security Administration

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Goals

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- By the end of this short course, you should be able to:
  - Understand the underlying theory behind PFLOTRAN
  - Install PFLOTRAN
  - Understand the basics of setting up PFLOTRAN input files
  - Execute PFLOTRAN simulations
  - Visualize results PFLOTRAN with:
    - Python: matplotlib
    - ParaView
  - Understand PFLOTRAN terminology well enough to submit well-informed questions to the pflotran-users mailing list