Bruxelles, September 2018

Equations

`https://camillejr.github.io/science-docs/`

1 PC-transport

$$\rho \frac{D\phi}{Dt} = \mathbb{D}\nabla^2 \phi + S_\phi$$

$$S_\phi(\phi) = f(T, p, Y_1, \dots, Y_{N_S - 1})$$

$$\rho \frac{D\boldsymbol{\Phi}}{Dt} = -\nabla(\boldsymbol{j}_\Phi) + \boldsymbol{s}_\Phi$$

$$\rho \frac{D\boldsymbol{z}}{Dt} = -\nabla(\boldsymbol{j}_z) + \boldsymbol{s}_z$$

$$\rho \frac{\partial \boldsymbol{\Phi}}{\partial t} + \rho \vec{\boldsymbol{V}} \cdot \nabla \boldsymbol{\Phi} = \nabla \rho \mathbb{D}_\Phi \nabla \boldsymbol{\Phi} + \boldsymbol{S}_\Phi$$

$$\rho \frac{\partial \mathbf{z}}{\partial t} + \rho \vec{\boldsymbol{V}} \cdot \nabla \mathbf{z} = \nabla \rho \mathbb{D}_\mathrm{z} \nabla \mathbf{z} + \boldsymbol{S}_\mathrm{z}$$

$$\mathbf{z} = \boldsymbol{\Phi} \mathbf{A_q}$$

$$k(x_i, x_j) = h^2 \exp\left(\frac{-(x_i - x_j)^2}{\lambda^2}\right)$$

$$\rho \frac{\partial \boldsymbol{\Phi}}{\partial t} + \rho \vec{\boldsymbol{V}} \cdot \nabla \boldsymbol{\Phi} = \nabla \rho \mathbb{D}_\Phi \nabla \boldsymbol{\Phi} + \boldsymbol{S}_\Phi$$

$$\rho \frac{\partial \mathbf{z}}{\partial t} + \rho \vec{\boldsymbol{V}} \cdot \nabla \mathbf{z} = \nabla \rho \mathbb{D}_\mathrm{z} \nabla \mathbf{z} + \boldsymbol{S}_\mathrm{z}$$

2 Regression

$$\boldsymbol{\Phi} = [T, p,]$$

$$\boldsymbol{\Phi} \approx f_\Phi(\boldsymbol{Z}_q)$$

$$\boldsymbol{\Phi} \approx N(0, \sigma_n^2)$$

$$\boldsymbol{\Phi} \approx N(0, \boldsymbol{K}(\boldsymbol{Z}_p, \boldsymbol{Z}_q) + \sigma_n^2 \boldsymbol{I})$$

$$y_e = y_m(x) + \delta + \epsilon$$

3 Arrhenius law

$$k = A e^{\frac{-E_a}{RT}}$$

$$k = A e^{\frac{-E_a}{RT}}$$

$$k = A T^n e^{\frac{-E_a}{RT}}$$

$$\tilde{E} = y_m - \bar{y}_e$$