PhD Diary

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1 Calculus Book [19%]

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2 Things TODO

2.1 **DONE** High Performance Computing Course

2.2 **DONE** Meet with Jeroen

- Discussed helping out with wet-lab work, poss helping with some harvesting next week

- J is looking into any additional (side) projects I could possibly lend a hand with

- J is meeting with Eva D. during the week to discuss her thesis and possibility of working with her? Deinum (2013) (TBD)

2.3 FF Journal Club

- (Brulé et al.)

3 Diffusion Stuff

3.1 Convection Model

```python
def OneD_Conv_Model(nx=40, nt=60, dt=0.01, c=1):
    dx = 2/(nx)
    u = np.ones(nx)
    dtdx = dt/dx
    fig, axes = plt.subplots(2, 2)

    # Initial boundary Condition
    u[int(.5 / dx):int(1 / dx + 1)] = 2

    # For each time point
    for it in range(0, nt):
        un = u.copy()
        for i in range(1, nx):
            u[i] = un[i] - un[i]*(dtdx)*(un[i] - un[i-1])
        if it == 0:
            axes[0, 0].plot(np.linspace(0, 2, nx), u)
            axes[0, 0].set_title('T: {0}'.format(it*dt))
        elif it == int(nt/4):
            axes[0, 1].plot(np.linspace(0, 2, nx), u)
            axes[0, 1].set_title('T: {0}'.format(it*dt))
        elif it == int(nt/4)*3:
            axes[1, 0].plot(np.linspace(0, 2, nx), u)
            axes[1, 0].set_title('T: {0}'.format(it*dt))
        elif it == ((nt-1)/4)*4:
            axes[1, 1].plot(np.linspace(0, 2, nx), u)
            axes[1, 1].set_title('T: {0}'.format(it*dt))
    fig.tight_layout()
```
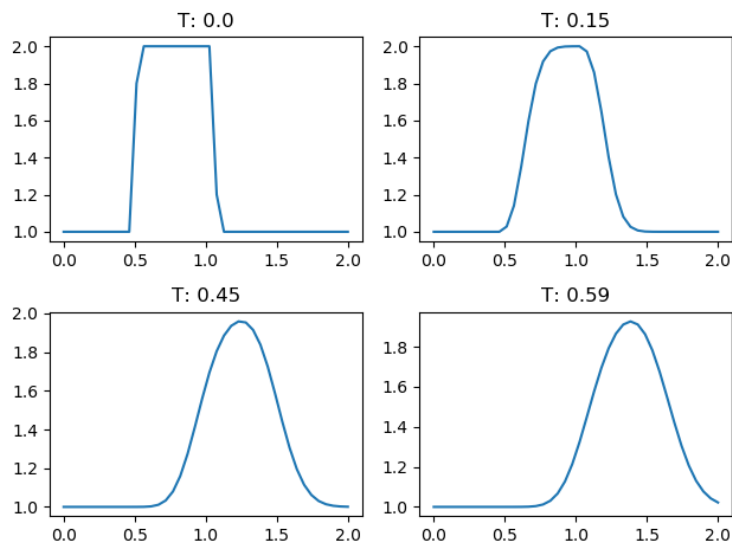

Figure 1: Convection Model

References

Daphnée Brulé, Clizia Villano, Laura J. Davies, Lucie Trdá, Justine Claverie, Marie-Claire Héloir, Annick Chiltz, Marielle Adrian, Benoît Darblade, Pablo Tornero, Lena Stransfeld, Freddy Boutrot, Cyril Zipfel, Ian B. Dry, and Benoit Poinssot. The grapevine (Vitis vinifera) LysM receptor kinases VvLYK1-1 and VvLYK1-2 mediate chitooligosaccharide-triggered immunity. *Plant Biotechnology Journal*, 0(0). ISSN 1467-7652. doi: 10.1111/pbi.13017. 00000.

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