09-03-2020 Meeting Minutes

Presentation Notes:

- Decide who wants to present what:
  - Lewis – Introduction and derivation of R model.
    - Slides 1 to 16
  - Shyman – Numerical simulations and derivation of N model.
    - Slides 17 to 27
  - Peifeng – Asymptotical analysis of R and N models.
    - Slides 28 to 31
  - William – Simulations of solute injection and conclusion
    - Slides 31 to 39
- We currently have 39 slides, would be good to aim to slim down to 30.
- Reduce height of videos in the presentation.
  - Remove black bar above and below the embedded videos.
- All videos/graphs need to be updated so that they are of a higher resolution (using 300dpi).
  - The DataVisualiser class on the GitHub repository has been updated.
- All simulation results should be updates so that they use the parameter settings inferred from the Peng paper.
  - Parameters shown on slide 18.
- All graphs should be updates so that the font size is readable.
- "seconds" should be abbreviated by "s" on all legend and axis labels.
- "nanometres" should be abbreviated by "nm" throughout the presentation.
- All graph axis labels should be reasonably short.
  - e.g. replace "Average nanoparticle radius" with: "Average R".
- All still image graphs should contain no title.
- All graph videos should contain a title of the form "Time: 1.234 hours", where the time is displayed in hours and contains 3 decimal places.

Presentation Run Through Remarks:

- Total presentation run though time was 25:47 minutes.
- Lewis (slides 1-16):
  - On slide 13 it might be worth stating which timescale corresponds to long time and which one corresponds to short time.
  - It may be worth explaining what the molar volume V_m is on slide 14.
    - It might be useful to give examples of the typical values of Δc and V_m, in order to explain why their product is order ε.
  - On slide 16 it might be worth explaining what D_a is (since this is where it first appears).
  - Current speaking time – 9:01 minutes.
- Shyam (slides 17-27)
  - On slide 20 it might be worth stating what the dissolving threshold used was.
    - Could be useful to reference the continuum hypothesis to explain why we can't have nanoparticles under a certain size.
  - May use the simulation on slide 21 to pivot and motivate the continuum model.
    - Could be useful to mention that we are only concerned with the overall distribution of particle sizes, in order to motivate the continuum model.

- On slide 22 it might be a good idea to add an additional equation in order to make the derivation clearer.
  - Image available at: https://www.lucidchart.com/invitations/accept/1f7b84d3-8d01-4e84-9d6b-bf9f51b6fafe
- The text on slide 25 is very comprehensive, however it might be worth trying to be more concise.
  - You could consider using bullet points to emphasise the key points.
- On slide 27 it would be good to resize videos to attempt to try and get rid of the black regions.
  - Can crop by dropping into windows media player and editing.
  - Would be useful to slow down the video so that it is easier to see the travelling waves.
- Current speaking time – 6:51 minutes.

- Peifeng (slides 28-31)
  - On slides 28 and 29 it might be useful to explain what the two cases for the value of D_a corresponds to physically (reaction or diffusion limiting).
  - On slide 28, the $R(t)$ term in the definition of the constant C should be removed.
    - Perhaps it might be a good idea to replace C by another constant (we have a lot of Cs already).
    - It might be useful to mention that our asymptotic expansion is only valid for small times (because we assume c_∞ to be constant).
  - On slide 29 it might be useful to explain the rescaling of time in more details.
    - You may wish to mention that since we are assuming D_a is large, our rescaling is valid and doesn't conflict with our original quasi-steady state assumption.
  - Current speaking time – 2:52 minutes.
- William (slides 32-39)
  - For slides 31 and 32 it might be useful to mention that we are looking to identify and characterise the growth and ripening stages before proceeding to asymptotic analysis.
  - On slide 30 it may be useful to omit the full expression of the travelling wave solution.
  - On slide 31 the graphic on the left-hand side need to be modified, since the top has been chopped off.
    - The time used in all graphs should display time in terms of hours.
  - On slide 33 the number of lines should be reduced in order to improve clarity.
  - On slide 35 it is important to explain that there is a finite supersaturation limit $c_\infty(0)$ that we cannot exceed.
  - On slide 34 it may be useful to reduce the number of different injection functions used, in order to improve clarity.
    - It may be best to use 1 convex and 1 concave function.
  - On slide 37 the injection concentration units need to be updated to mols m^{-3}.
  - Current speaking time – 7:03 minutes.

<u>Plan of Action:</u>

- Everyone should go through and make suitable modifications to their respective slides in the presentation (listed above) either this evening or tomorrow morning.

- Everyone should read through their corresponding slides and produce a plan/list of points they want to mention in their section of the presentation and individually rehearse (if time permits).
- Meet at 1pm on Tuesday in C1 to have another practice attempt at our presentation.
- Meet at 7pm on Tuesday in L6 (that is where the actual presentations will be) to have another practice attempt at our presentation.