**Preliminary plan for meeting w/c 8th May**

**Participants (in person):** Ludo, Tilio, Tina

**Participants (remote):** Anne, Chris

Main objective: finish and write up work on iron snow and flotation in generic small terrestrial bodies.

**Potential paper outline [and task leaders]**

1. Introduction. [Tina]

2. Methodology. [Chris/Tilio]

3. Discussion/justification of model parameters with focus on compositional effects [Anne]

4. Modelling results. [All]

5. Appraisal of the equilibrium assumption. [Ludo]

6. Discussion. [All]

Modelling Tasks: [Mainly Chris & Tilio]

1. Check results for iron snow cases from previous meeting.

2. Validate FeS flotation code.

3. Run new flotation cases in comparable configurations to the iron snow case.

Literature Tasks: [Anne, Tina, Tilio?]

1. Assemble reference lists for model parameter values.

2. Write discussion on effects of composition and the conditions under which snow/flotation is expected in the cores of small terrestrial bodies.

Non-equilibrium Tasks: [Ludo, Chris, All?]

1. Assess the assumptions used by Loper 92 to derive his Lambda parameter.

2. Produce a simple description of Lambda that can be evaluated with available data.

3. Derive a simplified version of Loper’s non-equilibrium eqn.

4. Assess the balance of terms from (3), which should indicate the significance of departures from equilibrium.

**Note - all times below are UK. CD will join at 9am UK time due to childcare commitments. All talks are scheduled for 1pm UK or later, which is 8am DC time so hopefully allowing AP to join.**

**Schedule for Team Meeting**

**Monday 8 May 2023:**

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| --- | --- | --- |
| **Time** | **Presenter** | **Activity** |
| 09.00 - 10:00 | All | Get started & review work from previous meeting |
| 10.00 - 10.30 |  | Break |
| 10.30 - 12.00 | All | Discuss plan for paper (see above) |
| 12.00 - 13.15 | All | Lunch |
| 13:15 - 14:00 | Chris | Review of results from last meeting |
| 14.00 - 14.30 | All | Discussion / Work on paper |
| 14.30 - 15.30 | All | Work on paper |
| 15.30 - 16.00 | All | Break |
| 16.00 - 17.00 | All | Work on paper |

**Tuesday 9th May 2023:**

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| --- | --- | --- |
| **Time** | **Presenter** | **Activity** |
| 09.00 - 09.30 | All | Work on paper |
| 09:30 - 10:30 | All | Work on paper |
| 09.30 - 10.00 |  | Break |
| 10.00 - 12.00 | All | Work on paper |
| 12.00 - 13.30 |  |  |
| 13:30 - 14:00 | Ludo | Current status of non-equilibrium analysis |
| 14.00 - 14.30 | All | Discussion |
| 14.30 - 17.00 | All | Work on paper |

**Wednesday 10th May 2023:**

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| **Time** | **Presenter** | **Activity** |
| 09.00 - 09.30 | All | Work on paper |
| 09:30 - 10:30 | All | Work on paper |
| 09.30 - 10.00 |  | Break |
| 10.00 - 11.00 | All | Work on paper |
| 11.00 - 12.00 | All | Work on paper |
| 12.00 - 13.30 |  |  |
| 13:30 - 14:00 | Chris/Tilio | Results from FeS flotation calculations |
| 14.00 - 14.30 | All | Discussion of flotation results |
| 14.30 - 17.00 | All | Work on paper |

**Thursday 11th May 2023:**

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| **Time** | **Presenter** | **Activity** |
| 09.00 - 09.30 | All | Work on paper |
| 09:30-10:30 | All | Work on paper |
| 09.30 - 10.00 |  | Break |
| 10.00 - 11.00 | All | Work on paper |
| 11.00 - 12.00 | All | Work on paper |
| 12.00 - 13.30 |  |  |
| 13:30 - 14:00 | Ludo/Chris | Results from refined non-equilibrium analysis |
| 14.00 - 14.30 | All | Discussion of flotation results |
| 14.30 - 17.00 | All | Work on paper |

**Old Paper outline**

1. Intro (Tina)

* Why this study?
* General background magnetic history and iron snow in small planetary bodies

Subsection: Composition (Anne)

1. Model setup (Chris, Anne, Tilio, Tina)

* core only (Leeds code): equations solved (Sam, Chris, Tina)
* core temperature two basic scenarios: purely adiabatic and stable layer (thermal)
* maybe different core compositions: Fe-Si, Fe-C? (Anne)
* thermodynamic model (Tilio): equations, table with parameters (Tilio)
* input parameters: core size, fixed but varying CMB heat flux, varying sulfur concentration (Tina)

1. Results (for classic and stable) (Tina, all)

* example evolution of E,Q, rsnow, and scaling
* regime diagrams: Ej vs tsnow\_final, Rm vs  Bf, Rof vs. Ipf, ADRs vs. ADRf
* scaling of Ej, tsnow\_final, Rm for differently sized bodies?

1. Discussion (Tina, all)
2. Subsection: Approximations sensible (Ludo)

Add: things that Ludo did (estimates on sinking velocities, ...) and Anne‘s estimates on different compositions

**Non-Equilibrium Notes**

* assuming values for Lambda
* Loper 1992: estimate order of magnitude terms equation 3.9
* Ludo: N parameter from Reese paper (sea ice)?
* Sten: N parameter from experiments?

Way to go forward?

* take Lopers Eq. 4.24 for Lambda, plug in values
* make rough estimate with Eq. 3.9 or rather 5.26 to get an idea how important Psi (departure from equilibrium) is for different Lambdas