

Outline for the Coming Weeks

Next week, the plan is to sit down and decide between the two of us what equations from MHD are relevant to modelling the physics of the dynamo and the resulting magnetic fields. Once we know what equations we are working with, it will be important to talk about the actual process of creating the model. There will certainly be some aspect of numerical problem solving, so we will need to think of how we plan on solving this equations. This could be an opportunity to go back through some of the computational work from PHY 481 to scaffold our solver. Once we know what we are solving, we will be set to start working on the code(s).

Following that process, we will work during the following week to actual make the solver work. This will involve the two of us committing time to work on the code and also coordinating our efforts so that we are not overwriting what each other does. Once we get the solver written, it will be a good idea to test it and look for any problems. This will be an opportunity to compare with what we would expect from theory and what other works have shown for this problem. If we get something radically different that what we would expect physically, then we need to look into problems with the solver over the next week to make it work properly.

If the solver is working like we would expect after that week, then the following week should be dedicated to continuing our calculations and generating all of the relevant plots for the poster. Regardless of what point we are at with the solver, this will also be a good time to think of how to motivate the reason for MHD calculations. Actual examples of MHD systems where these dynamos do something useful, like generating Earth's magnetic field, can be tied into what we are doing in this project. We can dedicate some time to this and preparing the poster material.

Finally, we should have all of our plots done in the last week and a good idea of what we want to present. We can work on the poster in that last week and work on the presentation itself. If there are any outstanding plots or problems, this week would be the deadline to solve them, since they are a major portion of this project.