

Project plan

Simulations of magnetic dipoles on a spherical surface

1 Questions

- Should we code a graphical interface? **show interface**
- What will the theoretical component be exactly?
- Can we/I start the project now?

2 Initial steps (3-4 weeks)

- Get acquainted with existing code. (v.hard?)
- Acquaint Arjun with C++ code. (hard)
- Convert grains to magnets:
 - Change interactions. (medium)
 - Change shape from sphere to cylinder. (v.easy)
- Draw cube. (medium)
- Draw dodecahedron. (medium)
- Add buttons. (hard)
- Add interactivity. (hard)
- Enhance colours and textures of the graphics and GUI. (medium)
- Start working on the numerical schema. (v.hard)
- Draw flux lines (v.hard)

3 Reading literature (1-2 weeks)

- Wills, A. S., Ballou, R. and Lacroix, C. Phys. Rev. B 66, 144407, (2002).
- Bramwell, S. T. and Gingras, M. J. P. Science 294, 1495-1501, (2001).
- Ladak, S., Read, D. E., Perkins, G. K., Cohen, L. F. et al. Nature Physics 6, 359-363, (2010).

4 Experimenting with the schema and the configuration (1-2 weeks)

- Outputting data and analysing and plotting with Matlab:
 - Hamiltonian.
 - Flux.