

Magma Dynamics

Science to Add

- Large melt fractions
- Phase equilibria
- Thermodynamics

Scientific Problems

- Plate boundaries. MOR, subduction zones.
- Mantle melting, source chemistry in different settings. Plumes vs. MOR, etc.?
- Dike propagation.

Numerical Capability to Add

- Large viscosity contrasts (same issue in other communities: STT, LTT,MC)
- 3D. Need parallel capability. Solver based on PetSc should in principle be able to go parallel (MPI, etc.).
- Governing equations. Fenics: Allows flexible formulations (maybe converges to a solution?).
- Structured vs. Unstructured.
- AMR.
- Need to better understand coupling, different equations, different grids, etc.

Benchmarks

- In good shape.
- International benchmark?