TIME DISCRETISATION

CONSIDERATIONS:

- Ease of programming
- Control of timestep size

EXPLICIT METHODS:

- Easy to program
- Timestep restricted by stability via the CFL condition

IMPLICIT METHODS:

- Harder to program
- Timestep restriced by accuracy only

CURRENT CODE:

- Uses semi-implicit methods – a mixture of both.
  - Explicit throughout except implicit for temperature diffusion (density gets very small near upper boundary)
  - Implicit parts solved by direct solver

ISSUES:

- Do as much as possible explicitly. If run on fast machines, why not do everything explicitly and just take small timesteps?
- If not, and must do some things implicitly, what are the situations in which iterative solvers (+ multigrid acceleration) become cheaper than direct solvers?