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## TIME DISCRETISATION

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### 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 restricted 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?