

NUMERICAL METHODS - APPLICATIONS TO GEOPHYSICAL FLUIDS

- Introduction – Basic knowledge of numerical integration
- Numerical schemes (implicit, explicit) – finite differences – precision
- Errors: amplitude, phase, aliasing
- Solution of Ordinary Differential Equations: Convergence, stability, error propagation, stiff ODE
- Grid generation (3-D, 4-D, staggered)
- Parabolic Partial differential equations – Convergence and Stability criteria, error propagation, boundary conditions
- Application to heat transfer equation
- Elliptical Partial Differential Equations – Convergence and Stability criteria, error propagation, boundary conditions
- Application to Laplace and Poisson equations
- Spectral methods for the solution of the Primitive equations
- Applications (code development for various solutions): Diffusion equation, heat transfer, Wave equation