



AS202 Jan 3:0

Geophysical Fluid Dynamics

Instructor

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Teaching Assistant

Email:

Department: CAOS

Course Time:

Lecture venue: CAOS

Detailed Course Page:

Announcements

Brief description of the course

Deriving and analyzing the equations of motion for geophysical fluids. This is a fundamental course for students wanting to delve into the dynamics of rotating fluids. The course requires familiarity with basic fluid mechanics, ordinary and partial differential equations. A large portion of the course deals with linear waves supported by rotating and stratified fluids.

Prerequisites

fluid mechanics, ordinary and partial differential equations.

Syllabus

Shallow water equations. Linear solutions on f and beta planes. Characterization of the waves by their dispersion relations. Notions of phase speed and group velocity. Energy and momentum fluxes associated with these waves. Reduction of the to the quasigeostrophic equations by asymptotic expansions. Rossby waves and their properties. Boussinesq approximation and waves in a stratified fluid. Potential vorticity and its conservations.

Course outcomes

A firm grasp of the basic waves supported by rotating and stratified fluids. Basic notions of quasigeostrophic theory. The role of conservation laws in fluid dynamics.

Grading policy

50% in term tests and 50% final exam.

Assignments

Resources