MATH 5392 Introduction to PDEs and Waves for the Atmosphere and Ocean

Section Number 002, Spring 2016

Course Number: 26842

Lecture: MW 5:30-6:50pm, 109 Pickard Hall(PKH)

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Office Hours: MW 2:30pm -4:00pm or by appointment.

Prerequisite: Analysis, Partial Differential Equations.

Text: *Introduction to PDEs and Waves for the Atmosphere and Ocean,* Courant Lecture Notes by Andrew Majda

Course Description: We will introduce the PDEs and waves in atmosphere/ocean science, with emphasis on the connection between modern mathematics and geophysical flows where rigorous analysis, asympototic, qualitative, and numerical modeling all interact.

Topics: Chapter 1, Introduction: basic properties of the equations with rotation and stratification. Chapter 2, Some remarkable features of stratified flows. Chapter 3, Linear and nonlinear instability of stratified flows. Chapter 4, Rotating shallow water theory. Chapter 5, Linear and weakly nonlinear theory of dispersive waves with geophysical examples.

Requirements: Several Homework assignments.