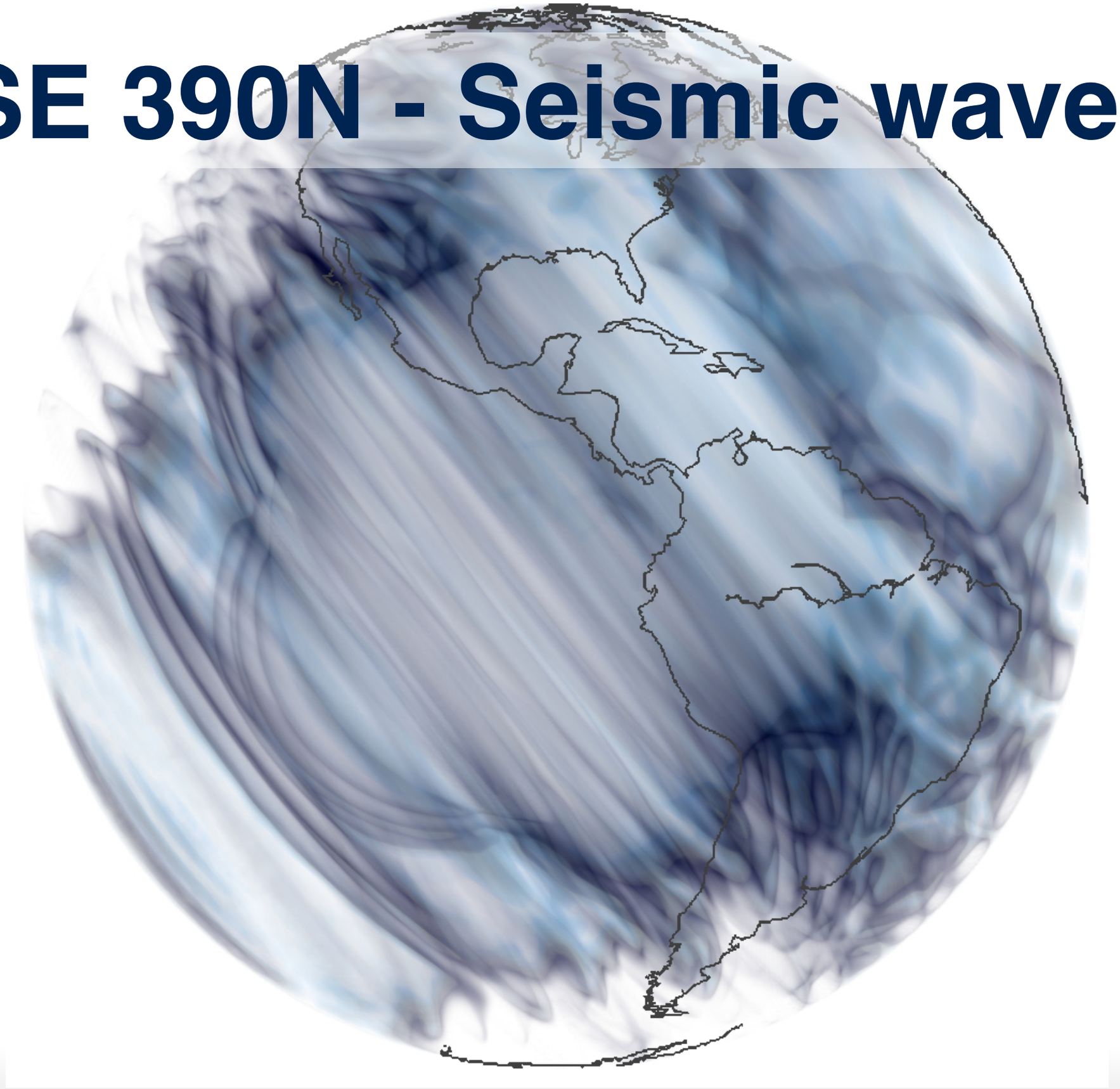
ErSE 390N - Seismic waves



Seismic waves

Spring Semester 2022

Lectures:
- This class will be given as a **full semester course**
- Language of instruction: **English**
- **Mon/Wed, 13:15 – 14:45**
- **Lecture material** available

Objectives:

Students will learn the theoretical and computational fundamentals of global seismic wave propagation. Major concepts about body and surface waves, as well as normal modes are introduced. Connections to imaging Earth 3D structure with ray-based methods, and methods beyond ray-theory are shown. Wave propagation phenomena such as attenuation, scattering and ambient noise are presented and studied by hands-on exercises.

After taking this course, students will have the background knowledge necessary to start an original research project in global seismology.

Instructor: Daniel Peter
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Student work:

Reading/Hands-on exercises and reports

Requirements:

- Attendance (highly recommended)
- Grades will be given as follow:
  60% quiz(zes)
  40% Homework/Assignments

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Schedule: (*tentative*)

week 1: Introduction, History of seismology

week 2: Betty's theorem and representation theorem

week 3: Seismic sources

week 4: Seismic sources, point sources, Volterra's theorem

week 5: Body waves

week 6: Surface waves

week 7: Normal modes

week 8: Ray theory, Finite frequency seismology

week 9: Attenuation

week10: Scattering

week11: Diffuse wavefields

week12: Ambient noise

week13: Numerical methods

week14: Ground motions for engineering

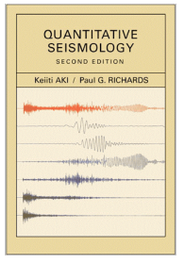
week15: Adjoint wavefields

week16: ***Semester ends***

Seismic waves

Spring Semester 2022

Learning material:



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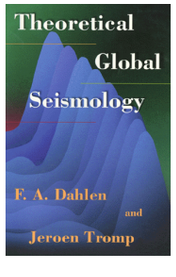

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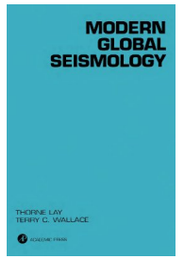
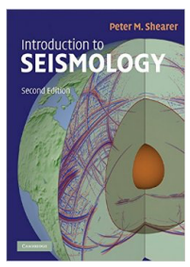


Lay, T. and T. C. Wallace, *Modern Global Seismology,* Academic Press, San Diego, 1995.



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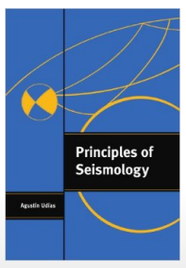

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