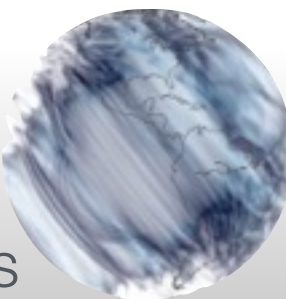
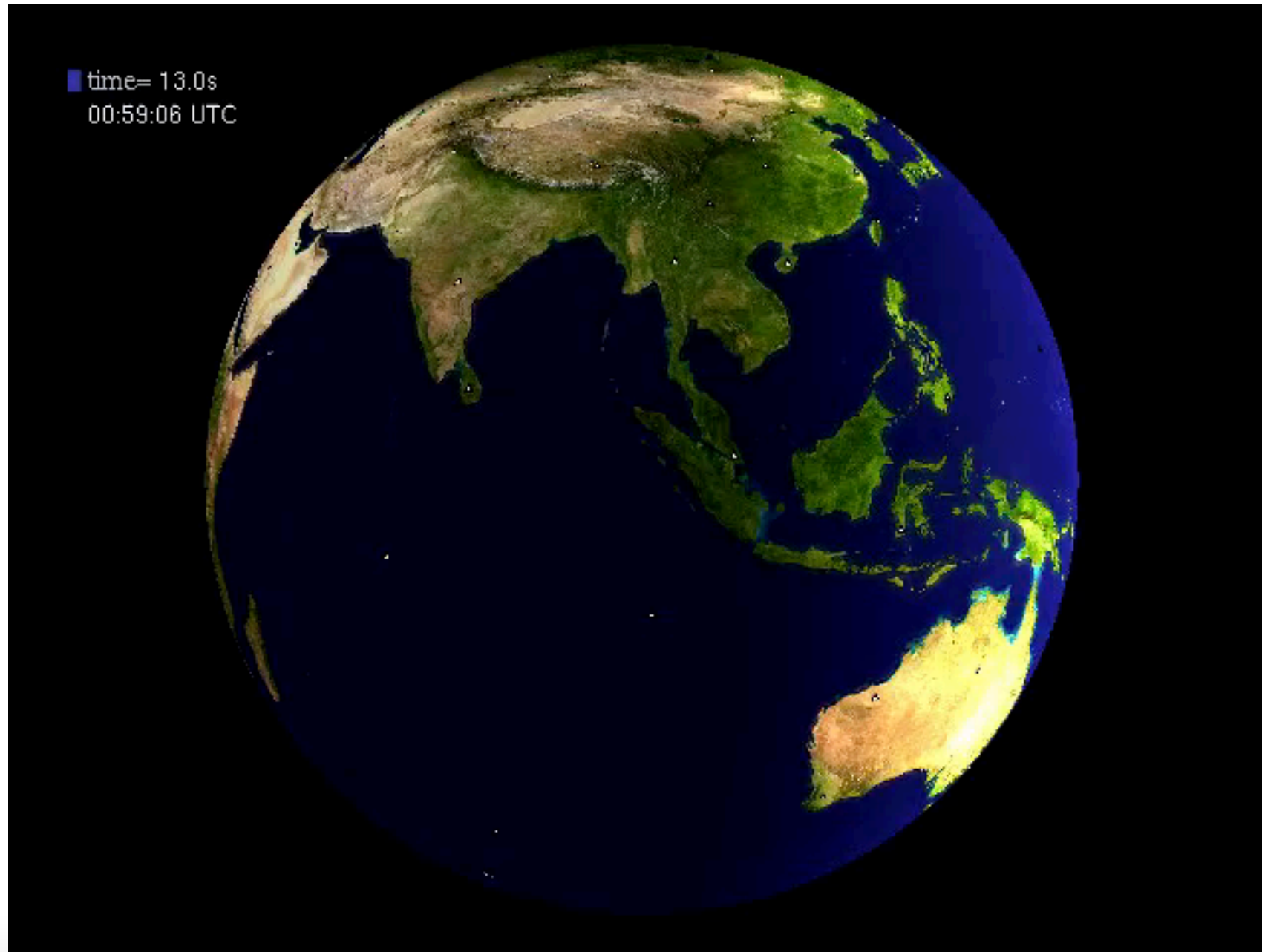


# Computational Geophysics

## ErSE 390C



# Computational Geophysics - ErSE 390C

Fall Semester 2016

## **Schedule:** (tentative)

week 1 Introduction to conservation laws for heat flow and wave propagation

week 2 Finite-differences method for heat flow

week 3 Finite-differences method for wave propagation

- No classes - Eid Al-Adha break

week 4 Higher-order Finite-differences method for tsunami waves

week 5 Introduction to Pseudo-spectral method

week 6 Pseudo-spectral method for wave propagation

week 7 Introduction to Finite-element method

week 8 Finite-element method for steady-state heat flow

week 9 Finite-element method for unsteady-state heat flow

week 10 Introduction to spectral-element method

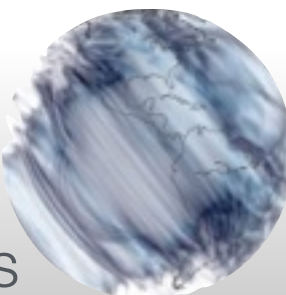
- No classes - semester break

week 11 Spectral-element method for heat flow

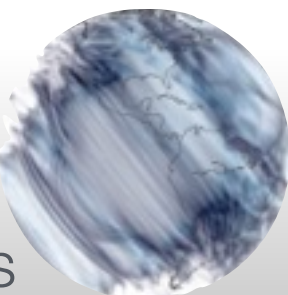
week 12 Spectral-element method for 1D wave propagation

week 13 Spectral-element method for 2D elastic wave propagation

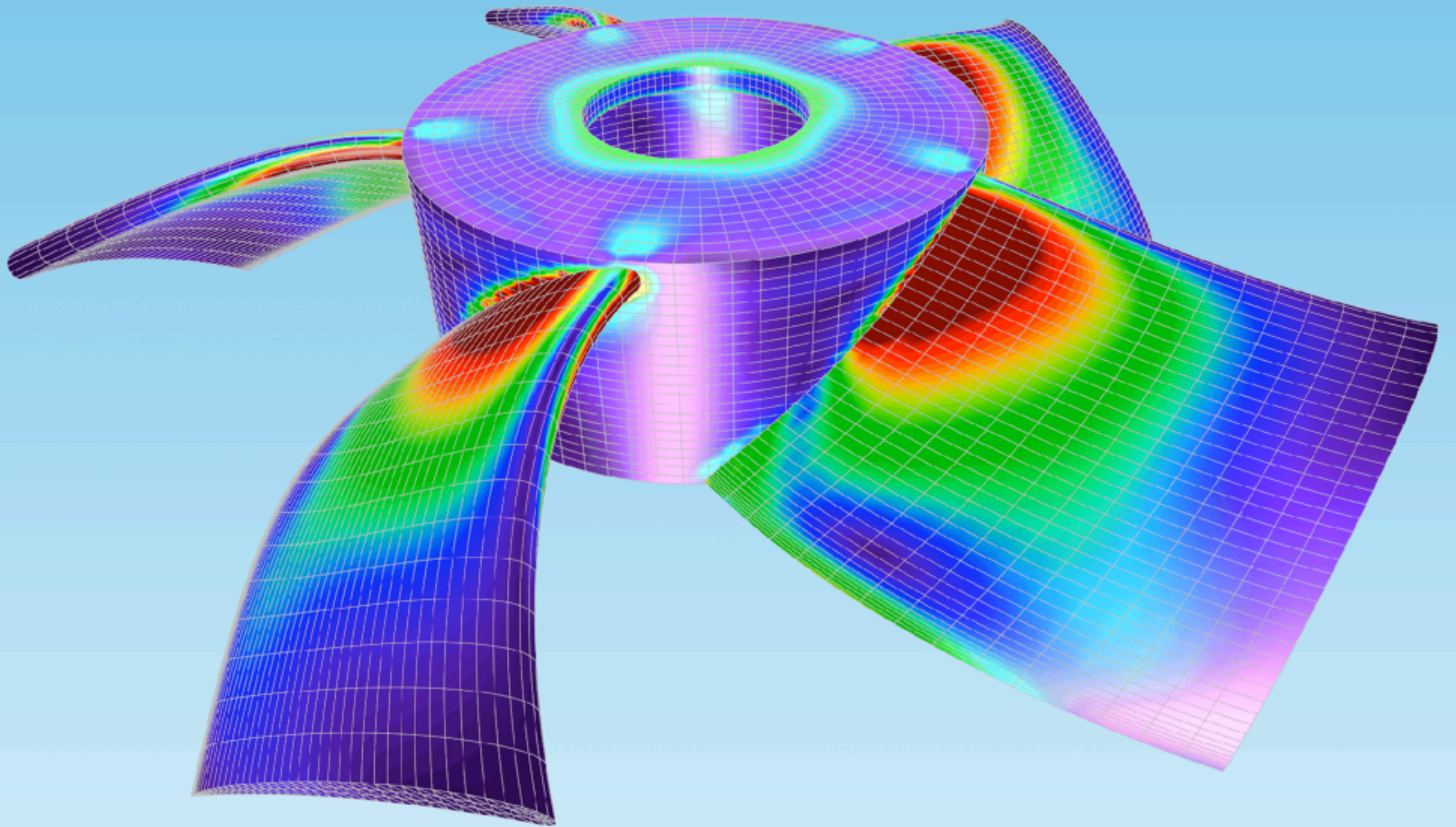
week 14 Spectral-element method for 3D viscoelastic wave propagation



# Finite-element methods





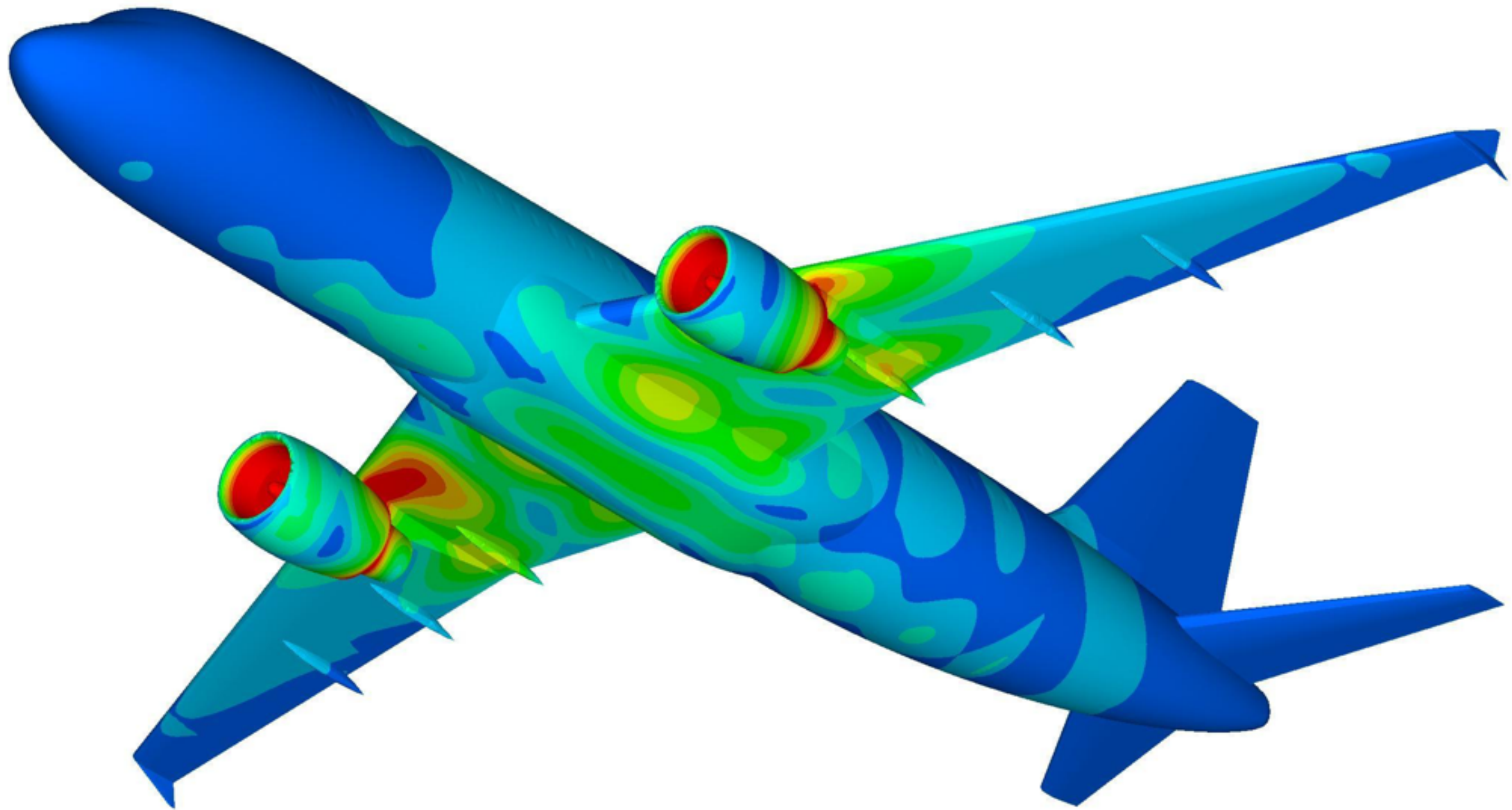


Civil engineering

Computational Geophysics







Aeronautics

Computational Geophysics



# Finite-element software

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commercial

**Comsol**

**Abaqus**

**Autodesk**

**ANSYS**

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open-source

**FEniCS**

**deal.II**

**OpenFOAM**

**code\_aster**

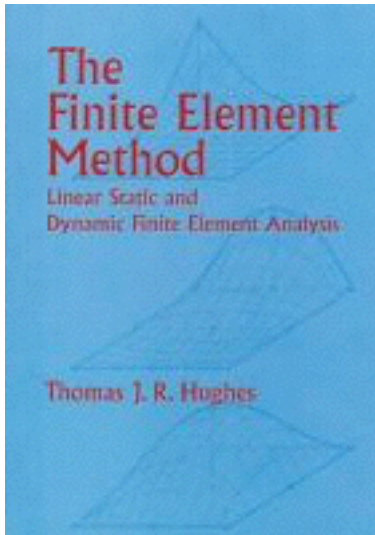
**Elmer**

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# Finite-element literature

## books



Thomas J.R. Hughes.

**The Finite Element Method :** linear static and dynamic finite element analysis,  
Mineola, N.Y. : Dover, 2000.



O. C. Zienkiwicz, R. L. Taylor and J. Z. Zhu.

**The Finite Element Method :** its basis and fundamentals,  
ISBN: 978-1-85617-633-0.

