Geodynamics

Flexure of the lithosphere
Lecture 6.1 - Flexure of an elastic plate

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Goal of this lecture

- Introduce the concept of **flexure of the lithosphere** using 2D elastic plates
Flexure of the lithosphere in foreland basins

A. NORTHERN BIGHORN BASIN

- BEARTOOTH MOUNTAINS
- Tertiary
- Paleozoic
- Mesozoic
- Pre cambrian

B. NORTHERN GREEN RIVER BASIN

- OVERTHUST BELT
- Wind River Mountains
- Tertiary & Mesozoic
- Paleozoic
- Pre cambrian

Modified from Royle, Wamer, and Reese, 1975

Hagen et al., 1985
Flexure of the lithosphere Hawaii

Watts et al., 1985
In the last lecture we considered stresses applied to an elastic material in either uniaxial stress, uniaxial strain, isotropic stress or pure shear.

Today, we will consider **flexure** or **bending** of an **elastic plate** as a result of an **applied load** or **torque**.

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*Fig. 3.9, Turcotte and Schubert, 2014*
An elastic plate of thickness $h$ is shown here, pinned at both ends and with an infinite width along the $z$ axis.

A line load $V_a$ is applied, resulting in deflection (or displacement) $w$ at any point along the length $L$.

In order to determine the deflection, we need to balance the forces and torques acting on the plate.
Let’s see what you’ve learned…

- If you’re watching this lecture in Moodle, you will now be automatically directed to the quiz!

- References:
