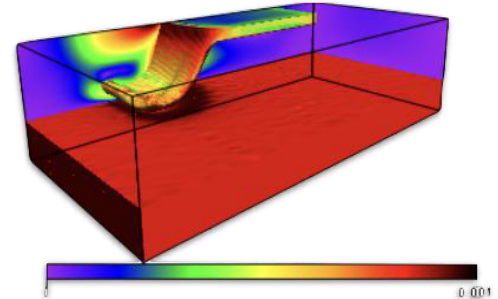


地球动力学数值模拟公开课

Dec. 2nd

Class 1 Intro to Geodynamics

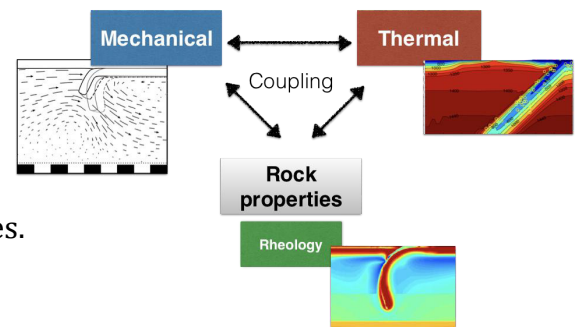
- Content
 - Intro to Geodynamics
 - Models in geodynamics. Numerical Models in Geodynamics
 - Examples of models
 - Modelling Software
- Goals
 - Get familiar with the basic processes.
 - Get familiar with some geophysical observables used to constrain Geodynamic processes.
 - Understand the role numerical modelling has in the study of geodynamic processes.



Dec. 3rd

Class 2 Physical processes

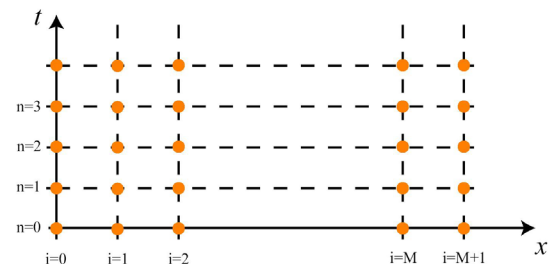
- Content
 - Basic processes in Geodynamical modelling.
 - Physical description of these processes.
- Goals
 - Get familiar with the basic processes, models and conservation equations.
 - To understand the basic function of the terms present on the equations (advection, diffusion, inertia, etc).
 - To understand the assumptions and simplifications taken on Geodynamic modelling.



Dec. 4th

Class 3 Numerical methods

- Content
 - How to solve the equations using a computer: Introduction to numerical techniques.
 - Finite Differences for the heat equation.

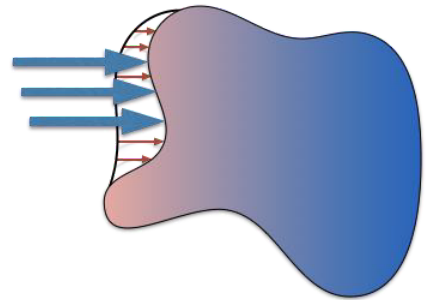


- Comments on Finite Differences for the flow problem
- Multiphase flow problems.
- Goals
 - Understand the numerical solution of a simplified heat equation using Finite Differences (FD)
 - Understand the concept of stability of a numerical scheme

Dec. 5th

Class 4 Physical properties

- Content
 - Physical properties of rocks.
 - Rheology. How rocks deform: Viscosity, Elasticity and Plasticity.
 - Density. Different models for density.
 - Dependence of viscosity and density on temperature, pressure, strain rate, etc.
 - Advanced topic: mineral physics and computational petrology.
- Goals
 - Get familiar with basic concepts of rheology
 - To understand the role of rheology in the computational cost of numerical simulations.
 - Models for other physical properties of rocks
 - Density
 - Thermal expansivity
 - Thermal conductivity



Dec. 6th

Class 5 Numerical Studies

- Content
 - Thermal evolution of the Oceanic Lithosphere.
 - Subduction dynamics and the origin of Andean orogeny.
 - Coupled mantle dripping and lateral dragging controlling the lithosphere structure of the NW-Moroccan margin and the Atlas Mountains

