

Advanced Course :: Geomechanics

What is its relationship with petroleum production?

It is a hands-on course that provides participants with the basics of numerical simulation necessary to use the principles of geomechanics to optimise petroleum production and decrease environmental damage risks.

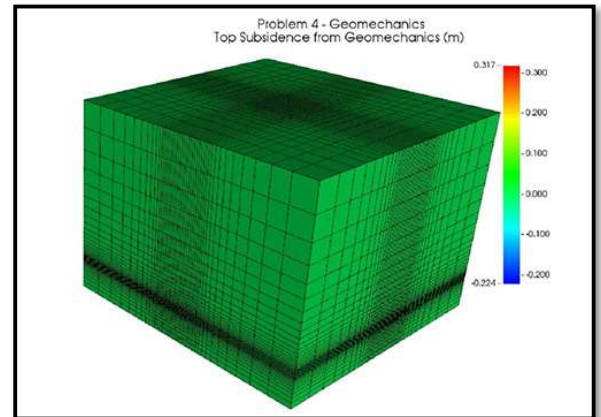
COURSE TYPE: LIVE STREAMING (05 DAYS, 20 HOURS)

GROUP 01: 30/JUN - 04/JUL (PORTUGUESE)

GROUP 02: 27 - 31/OCT (PORTUGUESE)

TIME: 14 - 18H (BRAZILIAN TIME ZONE)

COST: € 1000 :: + IVA

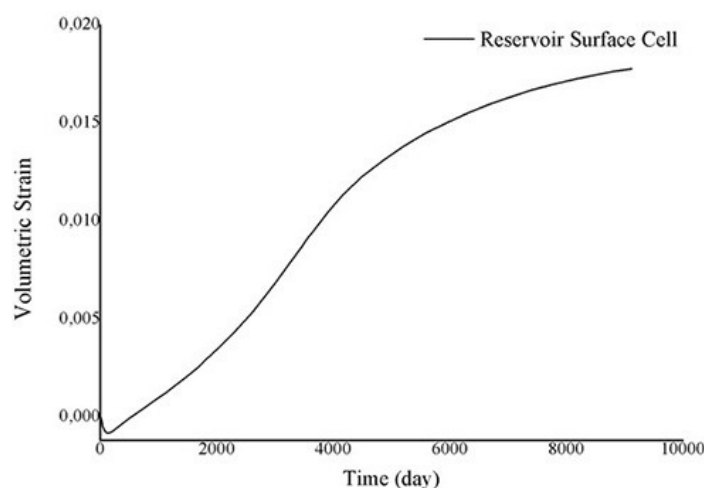


What is the relationship between geomechanics and petroleum production?

As a result of a certain amount of depletion, the production rate of a reservoir is primarily controlled by its effective permeability. Likewise, the ability of an injected fluid (water, gas) to efficiently displace hydrocarbons is also linked to effective permeability.

The effective permeability depends on the absolute permeability, fluid saturation, effective pressure and the surrounding stress. Moreover, the effective permeability can vary considerably due to fractures, karstified features, and the heterogeneous distribution of facies associations within a reservoir.

This variability results in barriers, flow channels, and reservoir compartmentalisation that controls how fluid is drained during depletion and supplemental energy projects



Volumetric deformation of the top of a reservoir with time.

Objectives

Provide the basics of numerical simulation, based on the geological modelling of problems 3 and 4 proposed by Dean et al. (2006, SPE Journal 79709), to use the principles of geomechanics in oil production. Problem 3 refers to the paradox of increasing pressure under depletion in cells at the interface of blocks of different stiffness. Problem 4 is adapted to represent the variation in permeability induced by pressure changes.

Upon completion, professionals are expected to understand and optimise the fluid flow in porous media with numerical approaches and characterization with geomechanics and other relevant physics in heterogeneous geological models.

Content

This hands-on course explains the flow-geomechanical coupled simulation procedure. And, considering the permeability variation, it discusses the results of modelling problems 3 and 4 by Dean et al. (2006) using a numerical methodology to indicate the influences of rocky domain and permeability in geomechanics and fluid-flow behavior. Thus, the role of geomechanics in oil production becomes evident.

- **Point 1:** Geological and reservoir models 3 and 4 according to Dean et al. (2006).
- **Point 2:** Geomechanics - Overview.
- **Point 3:** Geomechanics of Reservoirs.
- **Point 4:** Well Geomechanics and Geomechanics exercises.
- **Point 5:** Application of geomechanics to the Dean et al.
- **Point 6:** Discussion of results and summary.

Who should attend

Geologists and engineers working in the exploration and production of petroleum and other natural resources, storage of C and H, and injection of contaminants.

Instructor

- Luis **Glauber** Rodrigues, PhD