Contribution ID: **1116** Type: **No preference**

Quantification of Multi-Scale Nature of the Porous Media Flows and Scale Up: Experimental and Numerical Challenges

Thursday, 17 May 2018 13:45 (25 minutes)

Fluid flow in porous media has attracted enormous attention from academia and industry as it has numerous applications, such as hydrocarbon production, shale gas recovery, CO2 sequestration and ground water utilization, etc. The fluid flow is governed by different phenomena at different scales ranging up to 12 orders of magnitude in dimension (nm to 100 m), from nanoscale (pore proximity), to microscale (wettability, contact angle, etc.), to core-scale (capillary pressure, relative permeability, etc.), and to reservoir-scale (geological heterogeneity, saturation distribution, vertical equilibrium, etc.). It is still challenging to describe the representative fluid flow properties with quantification at a single or few scales. For example, some of the challenges include the difficulty of simulating the rock-fluid interactions at pore level, the limitation of current imaging technologies in terms of incapability of characterizing the sub-micron pores, and the improper use of core-flood results (e.g., relative permeability, capillary pressure) in reservoir simulations without careful upscaling. This talk aims to cover the current state-of-the-art technologies for experimentation and simulation of multiphase fluid flow in porous media, and to shed light on some of the common pitfalls and drawbacks. Finally, this talk will also review some of the insights gained from previous studies by the industry regarding fluid behaviors that affect flow in reservoir rocks in terms of the following focus areas:
1) Containment, porous media: geometry, topology, connectivity, etc.
2) Fluids contained, multi-component, multi-phase
3) Containment (porous media)-Fluid interactions
4) Multi-Physics/Multiscale Natura of the transport

References

Acceptance of Terms and Conditions

Click here to agree

Primary author: Dr DINDORUK, Birol (Shell Int. E&P)

Presenter: Dr DINDORUK, Birol (Shell Int. E&P)

Session Classification: Invited 4 (Room C) - Birol Dindoruk

Track Classification: GS 4: Porous media applications (renamed)