PVT Modelling and Flow Assurance with Multiflash®

1. Introduction
   Tutor(s)
   Course objectives
   Training materials

2. Multiflash fundamentals
   Model fundamentals
   Features of Multiflash
   Choice of thermodynamic models
   Choice of transport property models
   Flash calculations
   Fixed phase flash and tolerance calculations
   Solid freeze-out for pure solids
   Mercury partitioning

3. Fluid Characterisation
   Using data from a PVT report
   Oil and condensate characterisation
   Simultaneous characterisation of multiple fluids
   Importing a characterised fluid into Multiflash
Component lumping/delumping
Flash calculations, dew points, phase envelopes

4. **PVT lab and fluids regression**
EOS tuning and matching of properties
PVT experiments modelling and data regression
Sample QC
Mud decontamination
Multi-stage flash and recombination

5. **Natural gas hydrates**
Overview of gas hydrates
Gas hydrate model in Multiflash
Hydrate formation and phase boundary calculations

6. **Hydrate inhibition**
Overview of hydrate inhibitors
Hydrate inhibitor models in Multiflash
How to calculate the amount of hydrate inhibitors
Inhibition effect of salts

7. **Wax precipitation**
Overview of petroleum waxes
Thermodynamic wax model in Multiflash
Waxy crude/condensate characterization
Tuning the wax model to match experimental data
Impact of wax precipitation on wax deposition
8. **Asphaltenes**
   
   Overview of asphaltenes
   
   The Multiflash asphaltene model
   
   Asphaltene precipitation curve and phase envelope calculations
   
   Modelling the effect of gas injection on asphaltene stability in crudes
   
   Effect of blending on asphaltene flow assurance

9. **Multiflash Excel Interface**
   
   Multiflash Excel functions and function arguments
   
   Setting up an Excel application

10. **Case Studies**
    
    Solve problems, involving various topics, using the Multiflash GUI and/or Excel.
    
    Main topics
    
    - Fluid characterisation – analysis of PVT reports, model set up and simulations
    - Wax separation
    - Hydrates formation
    - Asphaltenes precipitation