

Title: Applied Mathematics and its use to solve project-specific Petroleum Engineering challenges

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As a group of subsurface consultants, we are faced with continuous challenges to solve problems, and deploy ingenuity to interpret the clues that our expensive data acquisition allows us to obtain from Mother nature. We are then left to the difficult task of making decisions under uncertainty, as our interpretation suffers from a lack of sufficient proofing information. We are routinely asked to provide expertise on two main areas: how much oil is in place in a field (which is mostly a geological question), and how can we best recover it (that's a petroleum engineering question). I will focus this talk on the second aspect, and describe how we are always in need of creating models to understand how fluid flows within the rocks towards the wells. We will then describe the fundamental equations, briefly discuss the main challenges we face in applying these into numerical or analytical models. Finally, we will present the R&D focus areas of our company, and how we integrate Applied Maths with software engineering.