

“The Essentials of Rock Physics for Seismic Amplitude Interpretation”

A practical 4-day course presented by Dr. Rob Simm

About the Course

Presented since 1999 this highly acclaimed course illustrates how an understanding of rock physics is fundamental to the interpretation of seismic data (including AVO reflectivity and elastic inversion products) as well as constraining the perception of risk in drilling. The course is a combination of lectures and exercises.

Practical exercises utilise
www.ikonscience.com



RokDoc™ rock physics software.

Who should attend?

The course is designed for all geoscientists who wish to understand the principles of interpreting seismic data using rock physics models and gain awareness of how this may impact the perception of risk in exploration and production drilling. This is not a software course and previous knowledge of the software is not a requirement.

Commissioning the Course

This course can be commissioned for in-house presentation. For details and any other information please contact:

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Course Contents – Lecture Topics

1. Introduction

2. Fundamentals

Seismic basics, approach to seismic modelling, elastic parameters, modelling reflectivity, relating seismic data to models

3. Rock Properties and AVO

AVO response description, rock property controls on AVO

4. Rock Physics, AVO and Seismic Interpretation

Seismic interpretation and AVO, trend curves and the stratigraphic context of AVO, practical examples

5. Characteristics of Seismic Wavelets

Seismic bandwidth, zero phase and minimum phase, wavelet shape, zero phasing, enhancing frequency content

6. Resolution

Temporal resolution, net pay estimation and tuned responses, resolution – sections vs. maps

7. Well Ties

The well tie process, log calibration, the importance of wavelet shape, problems with assuming phase and timing, a quantitative approach to well ties

8. Deriving Inputs for Seismic Models

Gassmann's equation, relevant rock physics for rock characterisation and fluid substitution

9. Detailed Seismic Modelling

10. Seismic Trace Inversion

Seismic data and relative impedance, broadband inversion for absolute impedance, interpretation issues

11. AVO Analysis

2 term conventional AVO and the use of data projections (near far/ Intercept gradient). Data requirements for successful AVO analysis, seismic processing issues. Elastic inversion (EI, EEI), model based elastic inversions (2 and 3 term) for angle independent elastic parameters.

12. Issues in Applying Rock Physics in Prospect Evaluation

Course Contents – Exercises

1. AVO scenarios

2. Net pay prediction

3. Which tie is best?

4. Wavelets – where do you pick?

5. Fluid substitution and AVA modelling

6. Offset to angle

7. Would you drill this bright spot?

8. What is the likely interpretation of this amplitude anomaly?

9. The sensitivity of AI inversion to the low frequency component

10. Defining an AVO anomaly and the issues in calibration

Attendees will receive a fully documented manual with text discussion, including all illustrations shown in the course.

About the Presenter

Dr. Rob Simm is a seismic interpreter who specialises in applying rock physics in oil and gas exploration and production. Rob spent his early career (1985-1999) with operating oil companies (notably Britoil, Tricentrol and Enterprise Oil). In 1999 he established his own consultancy company, Rock Physics Associates Ltd, to provide project and training services. Rob currently works for Cairn Energy plc as a Senior Geophysical Adviser.

