

# “The Essentials of Rock Physics for Seismic Amplitude Interpretation”

A practical 3-day course presented by Dr. Rob Simm

## About the Course

This highly acclaimed course (now in its' 10th year) 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.

The practical exercises in this course use RokDoc® software which is provided by Ikon Science Ltd. [www.ikonscience.com](http://www.ikonscience.com)



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

## About Rock Physics Associates Ltd

Rock Physics Associates Ltd is an independent UK based geophysical consultancy specializing in rock physics interpretation of seismic data (project work and training). Over 100 courses have been given in the last 10 years and they have been favourably received. In-house presentations have been given to many companies including Shell, ENI and British Gas and representatives from over 70 other companies worldwide have attended through public and other presentations of the courses. Courses have been given in USA, UK, Holland, Italy, Norway, Mexico, Trinidad, India, South Africa and several other countries.

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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

## **About the Presenter**

Dr. Rob Simm is a seismic interpreter who specialises in applying rock physics in oil and gas exploration and production. With 24 years experience in oil industry exploration and field development, Rob has spent most of his career 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.

