

**SEG | DGS Workshop:**  
**Challenges & New Advances in Velocity Model Building**  
 9–11 March 2021 | Virtual Workshop

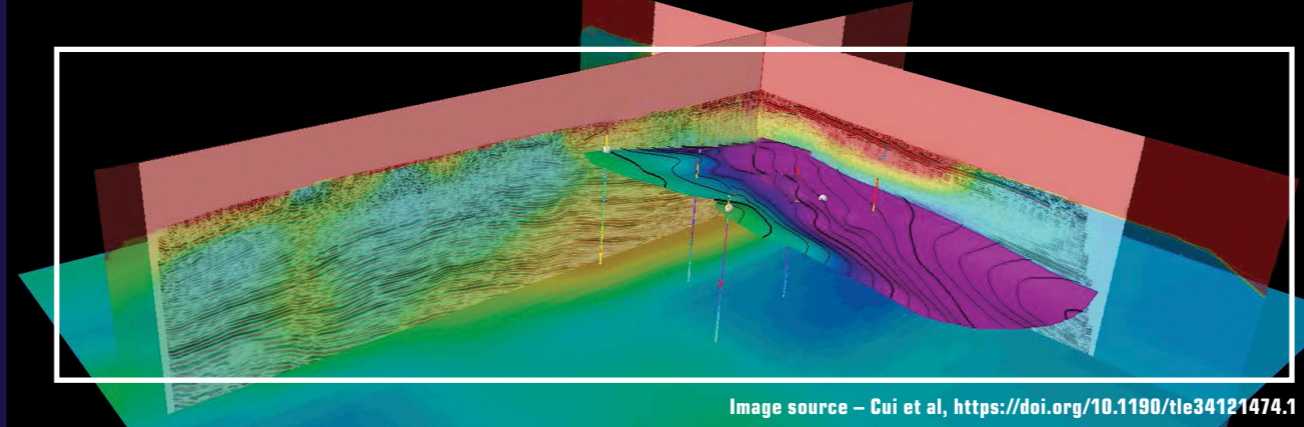


Image source – Cui et al, <https://doi.org/10.1190/tle34121474.1>

# PROGRAMME

CENTRAL STANDARD TIME  
(GMT - 6:00)

## PRELIMINARY TECHNICAL PROGRAMME

### Tuesday, 9 March 2021

#### CONCURRENT POSTER SESSION 1

Session Chair: Moosa Al-Jahdhami (Petroleum Development Oman)

06:40 - 06:50 **Accounting for Interbed Multiples in LSRTM and R-FWI Methods**

Mikhail Davydenko (Wavekoda)

06:50 - 07:00 **Considerations for Domain Conversion and Uncertainty Analysis**

Larry Fink (Halliburton)

07:00 - 07:10 **Uncertainties of Near-surface Static Corrections on Seismic Survey and their Impact on Geologic Interpretation and Well Placement**

Mohamed Ibrahim Mergany (Saudi Aramco)

07:10 - 07:20 **Seismic Traveltime Inversion Tomography: Crustal Velocity Model for the Malay Peninsula**

Osagie Abel Uyimwen (University of Abuja)

#### CONCURRENT POSTER SESSION 2

Session Chair: Tristram Burley (ION)

06:40 - 06:50 **Elastic Reverse Time Migration Imaging Condition Using Waveform Sensitivity Kernels**

Hong Liang (Aramco Americas)

06:50 - 07:00 **Computational Aspects of Traveltime Inversion Kernels for Acoustic Wave Equations and its Application to Finite-frequency Traveltime Velocity Inversion of OBN Geometry**

Houzhu (James) Zhang (Aramco Americas)

06:50 - 07:00 **A Weighting Function Method for Nearly Constant-Q Seismic Modeling**

Qi Hao (KFUPM)

07:10 - 07:20 **Comparative Analysis of 3D Velocity Model Building Methods for Time Depth Conversion in "swu" Field, Northeast Java Basin**

Muhamad Joko Tri Prasetyo (Universitas Gadjah Mada)

### Tuesday, 9 March 2021

All sessions are in Central Standard Time (GMT - 6:00)

03:00 - 04:00 PRE-EVENT NETWORKING & TROUBLESHOOTING

04:00 - 04:10 **Welcome Address by Committee Chairs**  
 04:10 - 04:25 **SEG Leadership Keynote Speaker - Anna Shaughnessy (SEG)**  
 04:25 - 04:45 **Opening Address by Saleh Al-Saleh (Saudi Aramco)**

#### SESSION 1 ROLE OF ACQUISITION

Session Chairs: Khaled Dulaijan (Saudi Aramco) & Fons ten Kroode (Shell)

04:45 - 05:05 **KEYNOTE: Innovation in Seismic Acquisition deserves more Attention and Investment**

John Etgen (BP)

05:05 - 05:25 **Revitalizing Prolific Hydrocarbon Basins and a Renewed Focus on Adjacent Frontier Basins –The Case of the Northern European Waters**

Adriana Citlali Ramirez (TGS)

05:25 - 05:45 **Resolving the Near-Surface Model Using Distributed Acoustic Sensing in a Shallow Land Well**

Ali Aldawood (Saudi Aramco)

#### SESSION 2 NON-SEISMIC METHODS

Session Chairs: Abdulatif Al Shuhail (KFUPM) & Eric Verschuur (Delft University)

05:45 - 06:05 **KEYNOTE: Joint Wavefield Inversion of P-waves with Transient EM and Surface Waves for High-resolution Near-Surface Velocity Modeling**

Daniele Colombo (Saudi Aramco)

06:05 - 06:25 **EM Methods Aid to Improve Velocity Model in Complex Area**

Tang Biyan (BGP)

06:25 - 06:40 NETWORKING BREAK – 15 min

#### CONCURRENT POSTER SESSIONS 1 & 2

\*Detailed schedule of poster sessions on the left

#### SESSION 3 BOREHOLE SEISMIC

Session Chair: Gerard Schuster (KAUST)

07:20 - 07:40 **KEYNOTE: Borehole Seismic Guided Velocity Model Building – Historical Perspective and the Way Forward**

Brian Hornby (Hornby Geophysical Services)

07:40 - 08:00 **Benefits of Joint Use of Borehole and Surface Seismic Data in Imaging**

Olga Zdraveva (WesternGeco)

08:00 - 08:15 NETWORKING BREAK – 15 min

#### SESSION 4 NEAR-SURFACE – PART 1

Session Chair: Gerard Schuster (KAUST)

08:15 - 08:35 **KEYNOTE: Effect of Shallow Low-velocity Anomalies on Deep Reflections**

Sherif Hanafy (KFUPM)

08:35 - 08:55 **Shear Velocity Model of the Ice Sheet and Upper Crust in Larsemann Hills (Antarctic)**

Lei Fu (Southern University of Science and Technology)

08:55 - 09:15 **Near-Surface Seismic Wave-equation Tomogram**

Jing Li (Jilin University)

09:15 - 10:15 POST EVENT NON-MODERATED FORUM

### Wednesday, 10 March 2021

All sessions are in Central Standard Time (GMT - 6:00)

03:00 - 04:00 PRE-EVENT NETWORKING & TROUBLESHOOTING

04:00 - 04:20 **Opening Address by Abdullah Al-Maamari (Petroleum Development Oman)**

#### SESSION 5 NEAR-SURFACE – PART 2

Session Chairs: Patrice Guillaume (CGG) & Abdulaziz Saad (Saudi Aramco)

04:20 - 04:40 **Processing for Velocity Model Building in a Desert Environment with Complex Near-Surface**

Andrey Bakulin (Saudi Aramco)

04:40 - 05:00 **Ambient Noise Seismic Interferometry – 2 Case Studies in Sultanate of Oman**

Omaima Al-Droushi (Petroleum Development Oman)

05:00 - 05:20 **Wave-path Tracking for Understanding the Near-Surface Shingle Waves**

Hongwei Liu (Saudi Aramco)

05:20 - 05:40 **Impact of Near-Surface Characterization on Velocity Model Building – Case Study from the Sultanate of Oman**

Mohammad Sheryar Farooqui (CGG)

05:40 - 06:00 **Refraction Tomography with Uncertainty for Near-Surface**

Anton Egorov (Aramco Research Center - Moscow, Aramco Innovations LLC)

06:00 - 06:15 NETWORKING BREAK – 15 min

#### SESSION 6 ANISOTROPIC VELOCITIES

Session Chair: Denes Vigh (Schlumberger)

06:15 - 06:35 **Elastic Velocity Model-building Using FWI with Geologic Constraints**

Sagar Singh (CSM)

06:35 - 06:55 **Complementary Role of FWI in Anisotropic Model Building Workflows and its Evolution**

Olga Zdraveva (WesternGeco)

#### SESSION 7 WAVE EQUATION TOMOGRAPHY

Session Chairs: Khaled Dulaijan (Saudi Aramco) & Moosa Al-Jahdhami (Petroleum Development Oman)

06:55 - 07:15 **KEYNOTE: Using all Multiple Scattering in Velocity Estimation via Joint Migration Inversion**

Eric Verschuur (Delft University)

07:15 - 07:35 **Extracting More from Refraction Traveltime Tomography**

Fuhao Qin (Saudi Aramco)

07:35 - 07:55 **Accelerated Exploration-scale Velocity Model Building Using a Monte Carlo Simulation**

Tony Martin (PGS)

07:55 - 08:15 **Data-domain Tomography for Initial Model Building on Land with Nonlinear Beamforming**

Ilya Silvestrov (Saudi Aramco)

08:15 - 08:30 NETWORKING BREAK – 15 min

#### SESSION 8 BIG DATA AND MACHINE LEARNING

Session Chair: Eric Verschuur (Delft University)

08:30 - 08:50 **KEYNOTE: Build Better Velocity Models with an Iterative Deep Learning – FWI Workflow**

Aria Abubakar (Schlumberger)

08:50 - 09:10 **KEYNOTE: Artificially Intelligent Velocity Model Building: Higher Resolution and Robustness**

Tariq AlKhalifah (KAUST)

09:10 - 09:30 **Seismic Inversion by Multi-Dimensional Hybrid Machine Learning**

Yuqing Chen (CSIRO)

09:30 - 10:30 POST EVENT NON-MODERATED FORUM

### Thursday, 11 March 2021

All sessions are in Central Standard Time (GMT - 6:00)

03:00 - 04:00 PRE-EVENT NETWORKING & TROUBLESHOOTING

#### SESSION 9 WAVEFORM INVERSION – PART 1

Session Chairs: Denes Vigh (Schlumberger) & Krzysztof K. Sliz (Saudi Aramco)

04:00 - 04:20 **KEYNOTE: FWI – Where It's Been and Where It's Going**

Ian Jones (ION)

04:20 - 04:40 **Towards Elastic FWI in Oman**

Fons ten Kroode (Shell)

04:40 - 05:00 **Inverting Reflections Using FWI with Inaccurate Starting Models**

Abdullah Altheyab (Saudi Aramco)

05:00 - 05:20 **An Efficient Workflow for Reflection-inclusive FWI in Frontier Environments**

Tony Martin (PGS)

05:20 - 05:35 NETWORKING BREAK – 15 min

#### SESSION 10 WAVEFORM INVERSION – PART 2

Session Chairs: Fons ten Kroode (Shell) & Tariq AlKhalifah (KAUST)

05:35 - 05:55 **KEYNOTE: Analysis of Different Objective Functions for FWI in Salt Environment**

Denes Vigh (Schlumberger)

05:55 - 06:15 **Application of Multi-dimensional Optimal Transport FWI in the Sultanate of Oman**

Diego Carotti (CGG)

06:15 - 06:35 **FWI in PDO: Historic Overview, a Review on Challenges and Update of Recent Successes**

Moosa Al-Jahdhami (Petroleum Development Oman)

06:35 - 06:55 **The Importance of Preprocessing for the Application of Land FWI in the Sultanate of Oman**

Ahmed Aziz (CGG)

06:55 - 07:15 **Efficient Land 1.5D FWI in a Surface-consistent Framework**

Ernesto Sandoval Curiel (Saudi Aramco)

07:15 - 07:30 NETWORKING BREAK – 15 min

#### SESSION 11 CASE STUDIES

Session Chairs: Daniele Colombo (Saudi Aramco) & Tristram Burley (ION)

07:30 - 07:50 **Benefits of High-resolution Velocity Estimation in Complex Geological Settings**

Krzysztof K. Sliz (Saudi Aramco)

07:50 - 08:10 **Field Focused Velocity Model Building in PDO: Tips and Pitfalls**

Said Al-Abri (Petroleum Development Oman)

08:10 - 08:30 **Integrated Velocity Model Building for Subsurface Imaging in Kuqa Depression, Western China**

Wenrui Jia (BGP)

08:30 - 08:50 **Velocity Model Building Challenges and Available Workflows in PDO**

Mohammed Al Balushi (Petroleum Development Oman)

08:50 - 09:10 **Wrap-Up by Arthur Weglein (University of Houston) – An Update and Status of Velocity Model Building-and the Consequences for Seismic Processing Methods and Objectives**

09:10 - 10:10 POST EVENT NON-MODERATED FORUM

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