

01 June, 2007

RDRG 2007 - Long Beach, California

Reservoir Deformation Research Group Committee Meeting

Long Beach, California

April 3, 2007 • 7:00 – 10:00 PM

Report

Current Chair Steve Naruk (Shell) opened the meeting, along with vice-chair John Walsh (University College Dublin) and more than 70 attendees. Steve solicited nominations for vice-chair in 2008. Alex Bump (BP) had been previously nominated, and with no further nominations from the floor, Alex was overwhelmingly elected. Structural geology / tectonics sessions for future meetings (2007 AAPG, 2007 AAPG Athens, 2008 San Antonio, 2009 Denver) were reviewed, with contributions from various people including Julia Gale and Don Medwedeff.

Steve then introduced the main topic for the evening, **Mechanical constraints on structural restorations and forward modelling**, and the panel group. The panel included Brett Freeman (Badleys Geoscience), Laurent Maerten (IGEISS) and John Walsh (University College Dublin). Each panel member provided a presentation, which was punctuated and followed by, often-times, animated discussions!

Their powerpoint files are provided below as PDFs:

- Steve Naruk and John Walsh: [Agenda](#) (PDF 622 Kb)
- John Walsh: [Discrete element modelling of the growth of fault zones in multi-layered sequences: a basis for future predictions of fault zone structure?](#) (PDF 3.7 Mb)
- Brett Freeman: [Elastic models of deformation in nature: why shouldn't we use the present day fault geometry?](#) (PDF 1.3 Mb)
- Laurent Maerten: [From 2D to 3D Mechanically-Based Restoration: Examples and Industry Applications Reservoir.](#) (PDF 3.2 Mb)

Open discussions were conducted throughout the presentations. Among the major topics/issues raised and the general conclusions arrived at are:

- The integration of numerical modelling within the workflow of company geoscientists is a challenge and, at present, is aspirational.
- Whether numerical modelling remains solely within the remit of the specialist structural geologist is not clear. There appeared to be a general consensus that much of this technology is currently too demanding, and immature, for usage by geoscientists in general.

- Mechanical modelling is, at the very least, a complement to existing analytical and modelling techniques, and provides one of the principal means of modelling sub-resolution structures in reservoir and fault seal studies.
- Continuing increases in computing power facilitate the generation of much more sophisticated models than hitherto.
- Mechanical modelling provides an important means of constraining sub-seismic fracture/fault models – links with flow can be made, but independent quantitative measures of fracture permeability will require coupled mechanical/flow modelling approaches.
- Discrete element modelling of faults/fractures, although a relatively immature research area in structural geology, seems to have significant potential for modelling faults and fractures.
- Whilst there are no fundamental concerns surrounding the application of elastic modelling to the prediction of certain sub-seismic structures, such as small faults and extension fractures, its use in the modelling of larger deformations is very contentious. The debate of stress vs strain continues!

John