# Examples

#### Peter Harris Deep Vision Ltd and Sharp Reflections

Deterministic AVA Inversion Workflow



PCUBE-type AVA Inversion Workflow



### Method

Buland, A., and H. Omre, 2003, Bayesian linearized AVO inversion: Geophysics, **68**, **185–198**. Buland, A., et al, 2008, Bayesian lithology and fluid prediction from seismic prestack data: Geophysics, **73**, **C13–C21**.



# The background

- Odin field, Norwegian sector, North Sea
- Frigg formations sands capped by lower Eocene shales
- Up to 80m high porosity sand
- 4-way closure appears to be submarine fan enhanced by differential compaction.



#### Data conditioning



### **Pcube: Bayesian Inversion**



#### Well work: synthetics



#### Well work: synthetics



#### Well work: litho-classes



#### Well work: litho-classes



### Well work: wavelets

One per angle stack 30/10-2





#### Angle stacks, 4°-12°



#### Angle stacks, 12°-20°



#### Angle stacks, 20°-28°



#### Angle stacks, 28°-36°



### Zp



## Vp/Vs



### Zp 16 ms below Top Frigg



#### Vp/Vs 16 ms below Top Frigg



#### Shale posterior probability



#### Oil sand posterior probability

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#### Undefined class posterior probability



#### Hard sand posterior probability

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#### Soft sand posterior probability



#### Overburden posterior probability

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### Minimum shale probability below T. Frigg



#### **Blind Test**

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Blue curve: blocked well log. Red curve: inversion result.

P Impedance S Impedance

#### **Blind Test**

P impedance (inverted) v. P impedance (well)

#### Vp/Vs (inverted) v. Vp/Vs (well)



#### **Blind Test**

Vp/Vs (well) v. P impedance (well)

#### Vp/Vs (inverted) v. P impedance (inverted)



#### Residuals



#### Residuals



### Zp reflectivity



### Vp/Vs reflectivity



#### **Density reflectivity!!**

