Recognition and characterization of small-scale sand inejctites in seismic data: Implications for reservoir development

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Preface

- This Powerpoint displays a summary of the seismic modelling results presented in the article «*Recognition and characterization of small-scale sand inejctites in seismic data: Implications for reservoir development*» by Alma Dzozlic Bradaric, Trond Andersen, Isabelle Lecomte, Helge Løseth and Christian Haug Eide, submitted for review March 2021.

- The PowerPoint allows the reader to flip through all the seismic modelling results in order to easily visualize the changes in seismic signature and detectability of the modelled sand injectite structures.

Tabel of contents

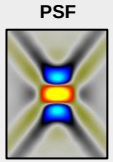
Conceptual small-scale sand injectite above reservoir:

- Three different geometries are modelled
- Width and geological dip of the different structures is varied.
- Length of the sand inejctites is kept constant (50 m)

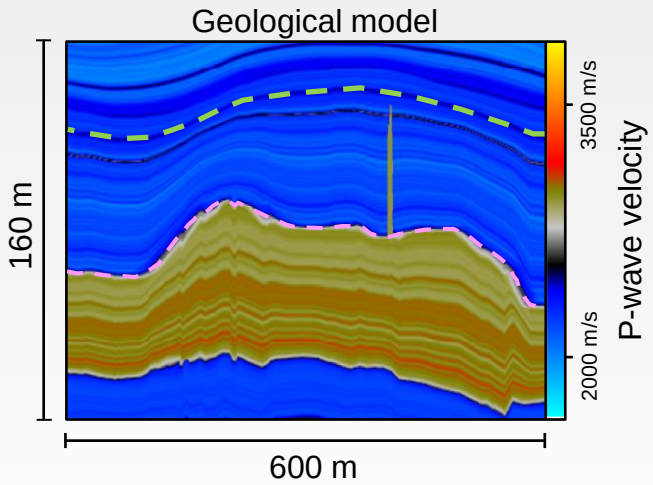
Single sand injectite models

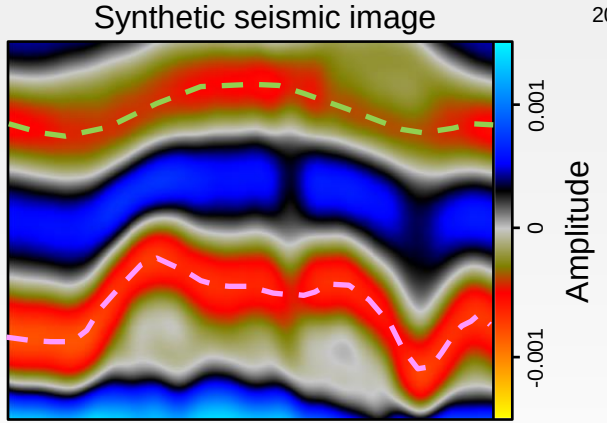
Conceptual models: Single sand injectites

- Width: 5 m, dip: 90°



20 Hz, max.ill 45°

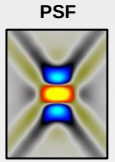




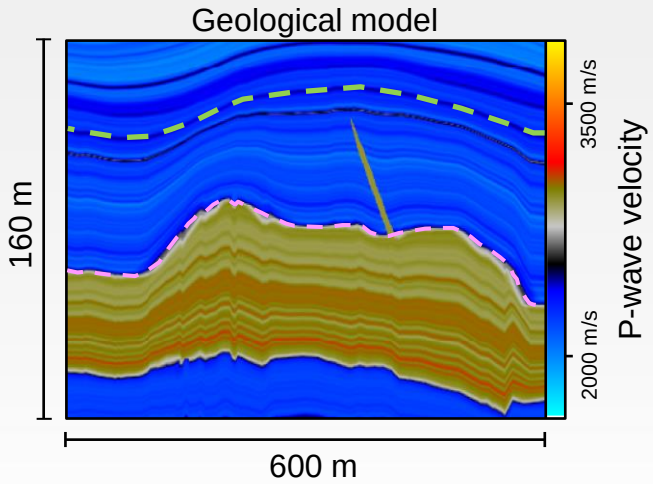
- Top reservoir - Top Sele

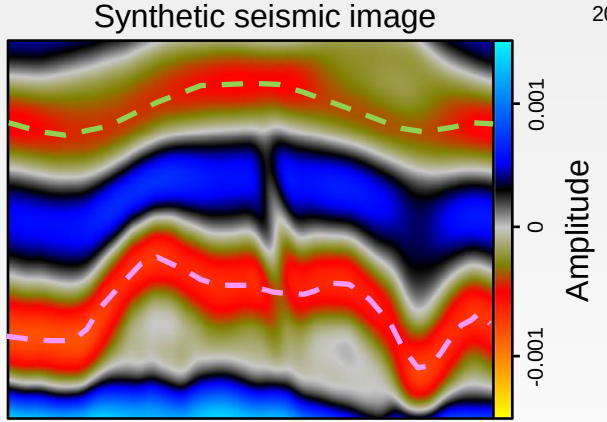
Conceptual models: Single sand injectites

- Width: 5 m, dip: 60°



20 Hz, max.ill 45°

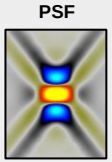




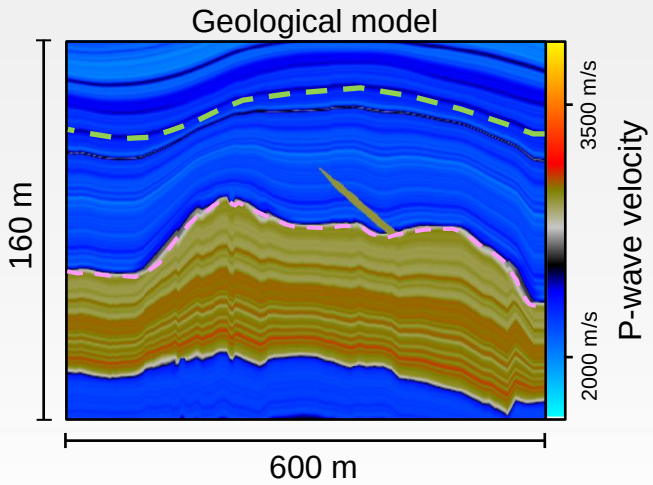
- Top reservoir - Top Sele

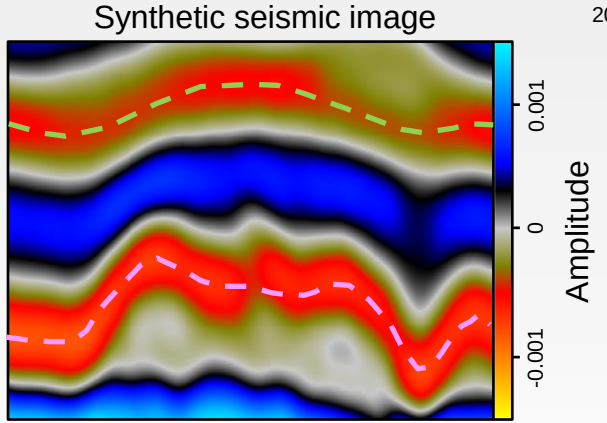
Conceptual models: Single sand injectites

- Width: 5 m, dip: 30°



20 Hz, max.ill 45°

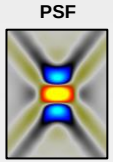




- Top reservoir - Top Sele

Conceptual models: Single sand injectites

- Width: 15 m, dip: 90°



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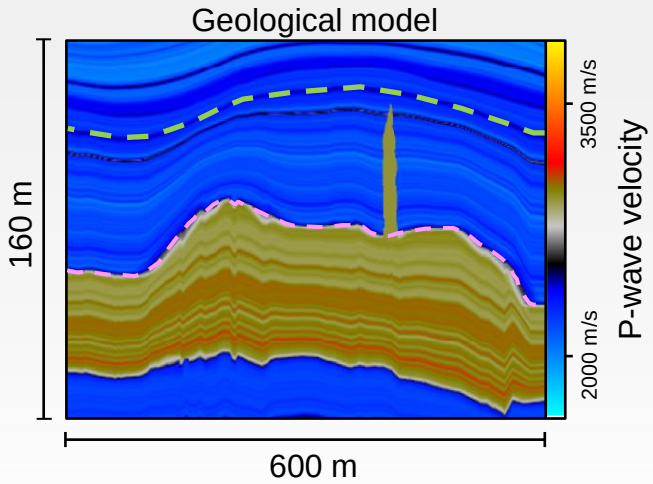
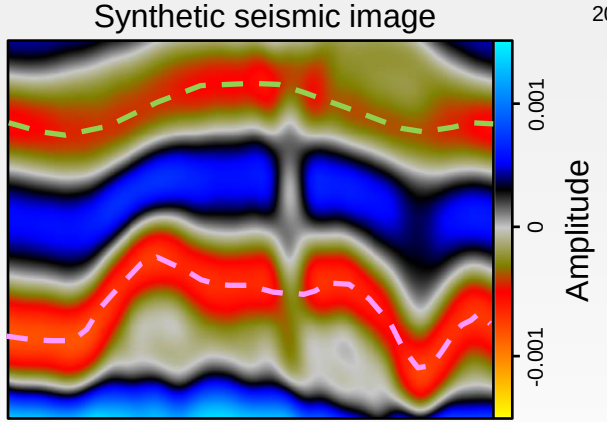
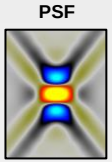




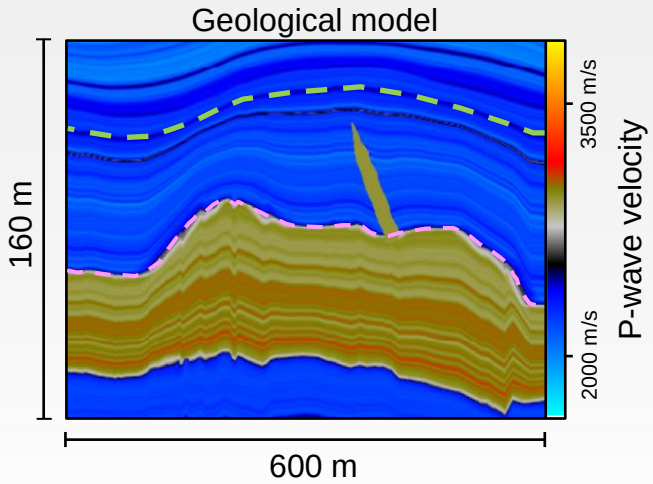
- Top reservoir - Top Sele

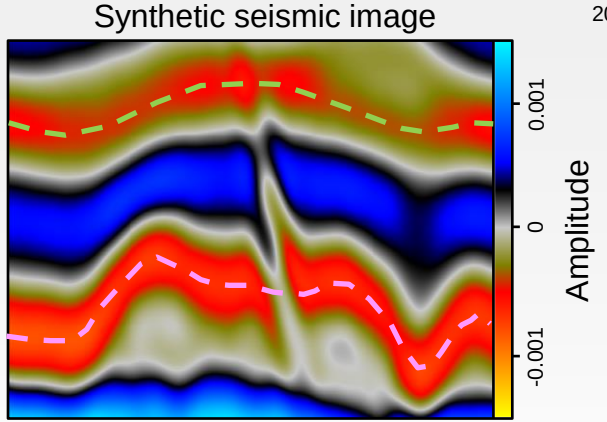
Conceptual models: Single sand injectites

- Width: 15 m, dip: 60°



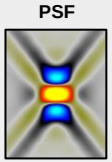
20 Hz, max.ill 45°



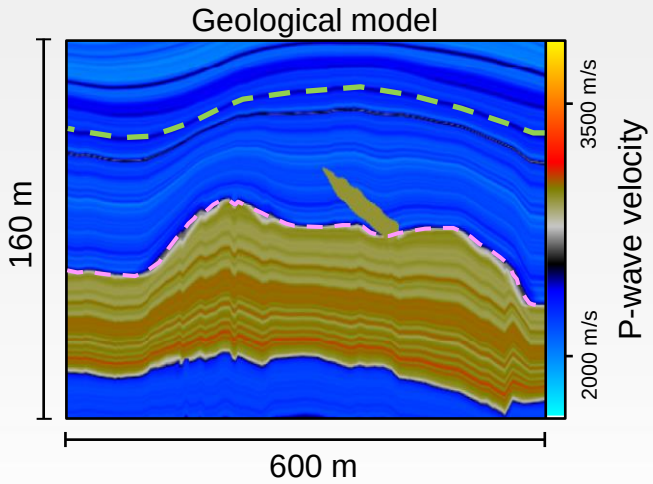


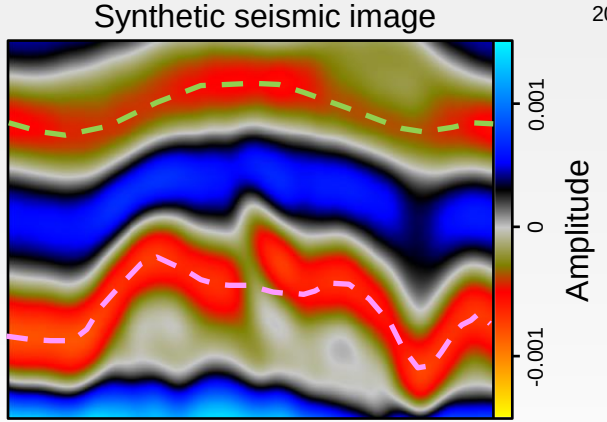
Conceptual models: Single sand injectites

- Width: 15 m, dip: 30°



20 Hz, max.ill 45°



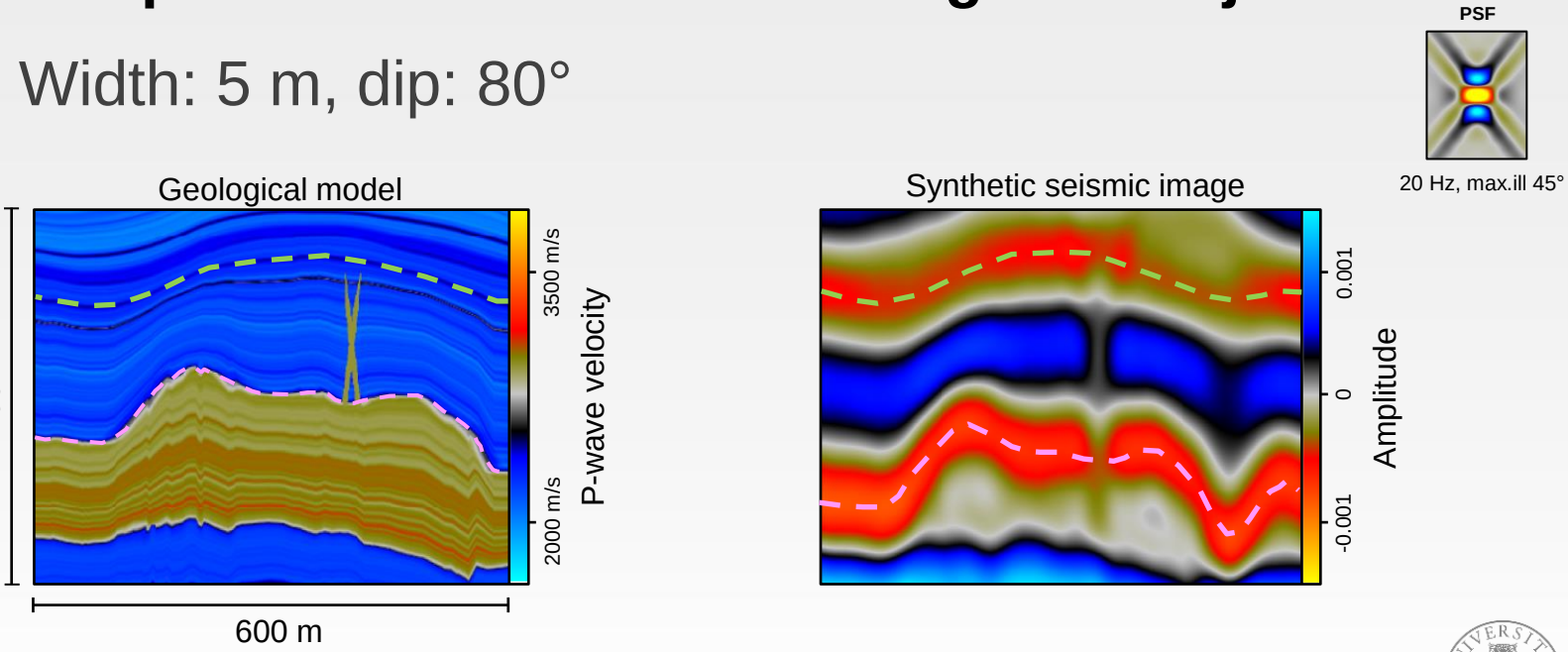


- Top reservoir - Top Sele

Cross-cutting sand injectite models

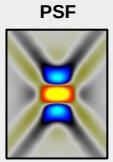
Conceptual models: Cross-cutting sand injectites

- Width: 5 m, dip: 80°

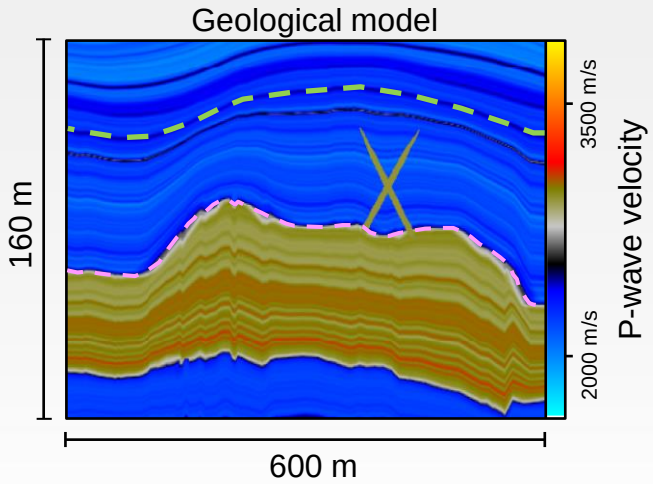


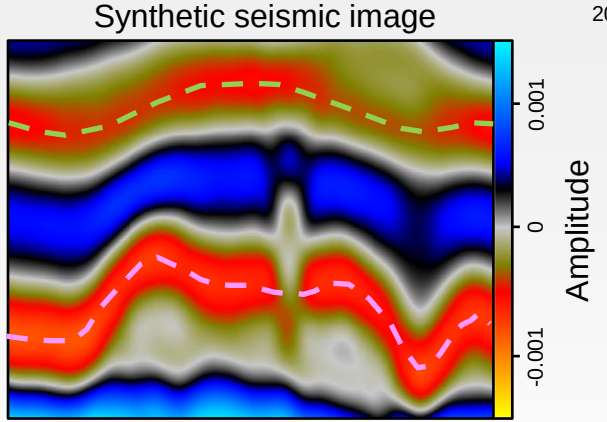
Conceptual models: Cross-cutting sand injectites

- Width: 5 m, dip: 50°



20 Hz, max.ill 45°

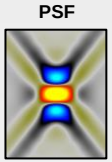




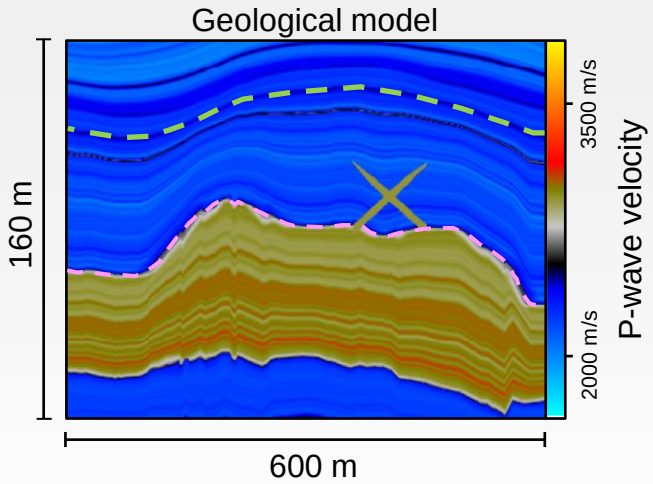
- Top reservoir - Top Sele

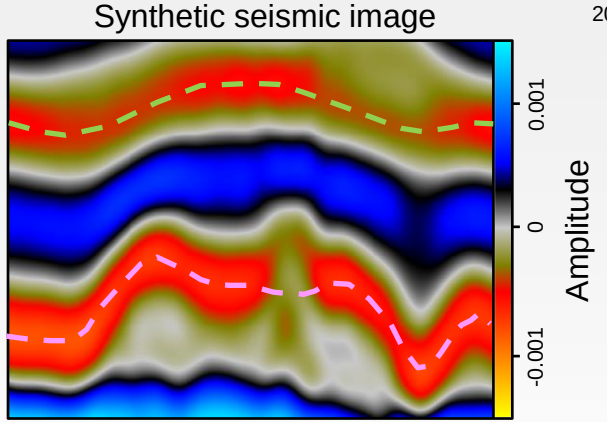
Conceptual models: Cross-cutting sand injectites

- Width: 5 m, dip: 30°



20 Hz, max.ill 45°

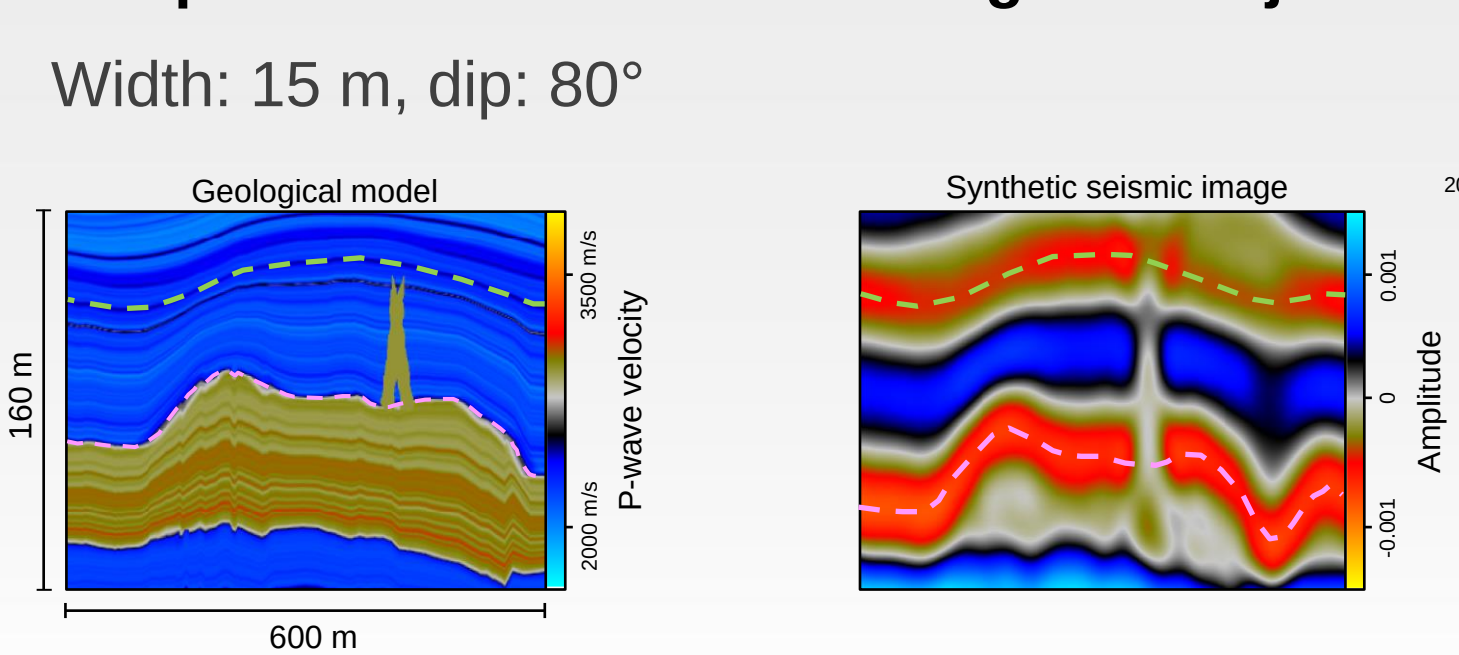




- Top reservoir - Top Sele

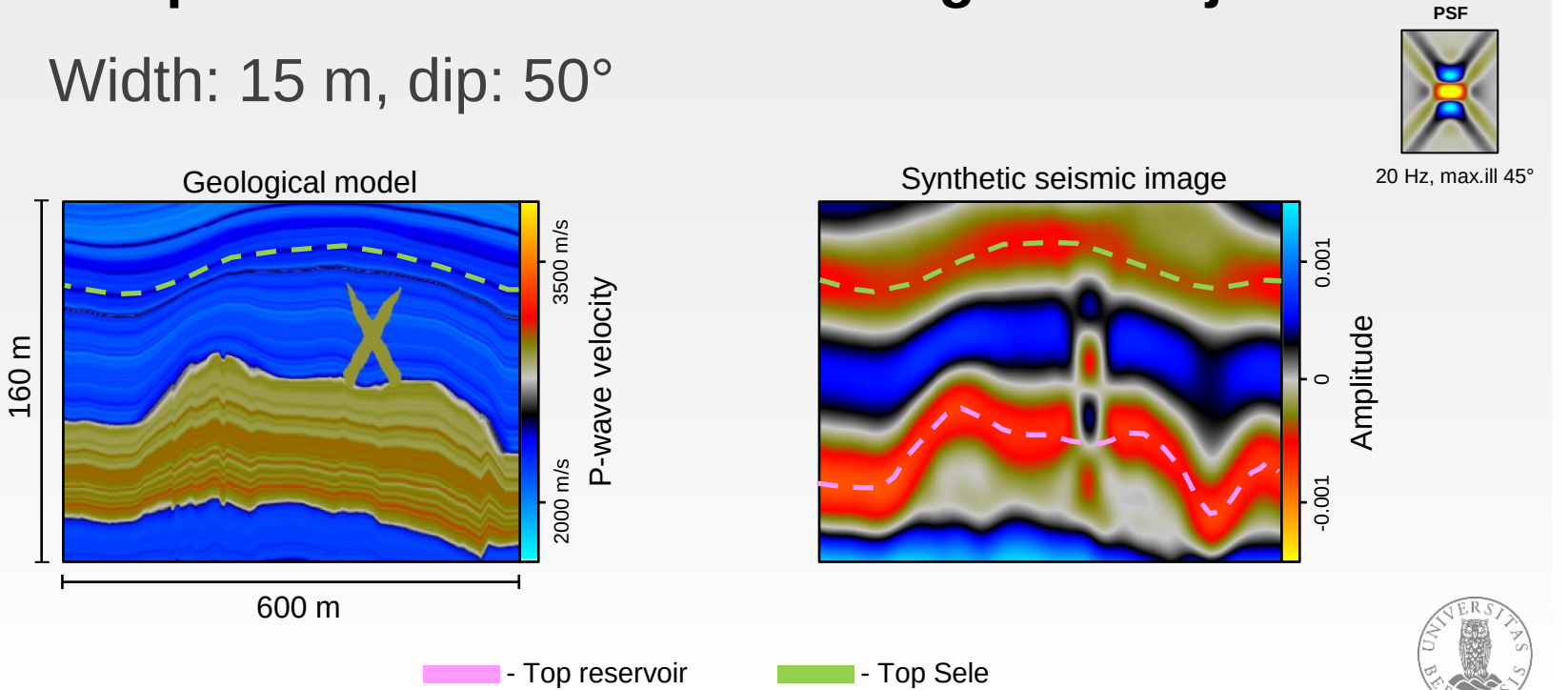
Conceptual models: Cross-cutting sand injectites

- Width: 15 m, dip: 80°



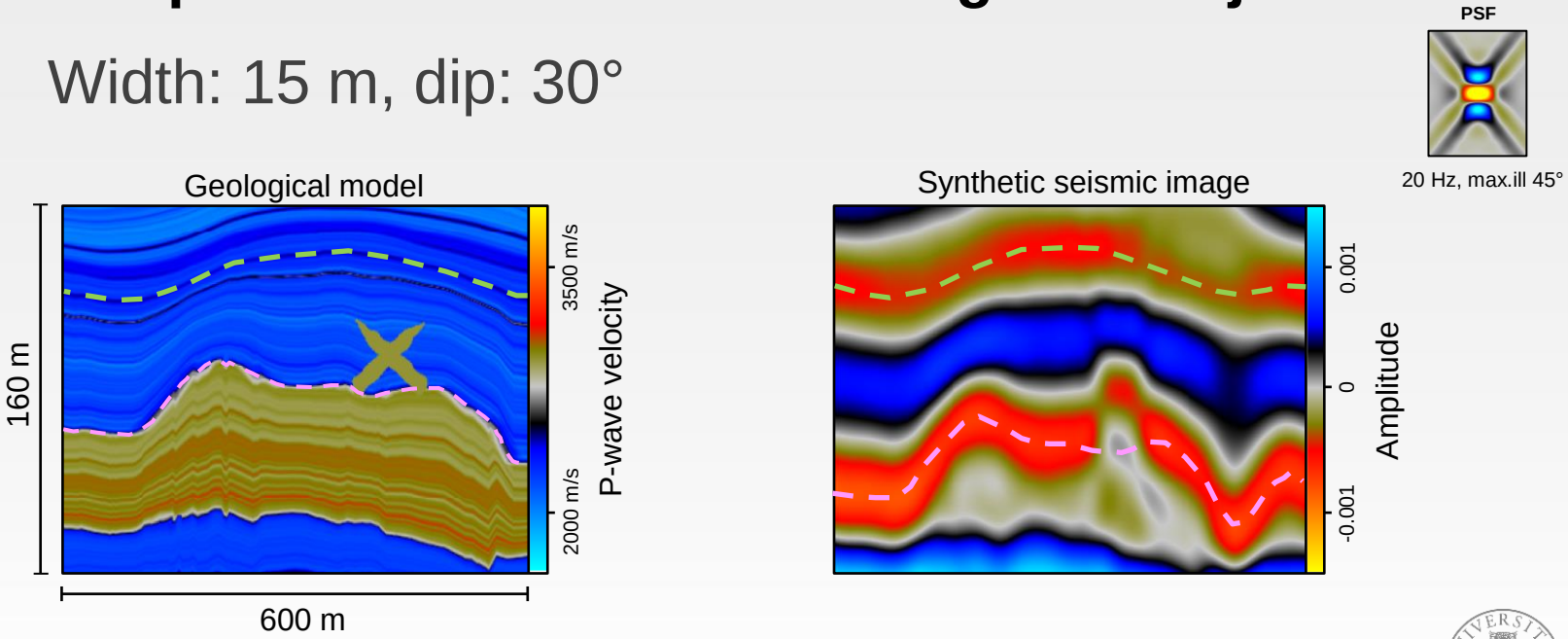
Conceptual models: Cross-cutting sand injectites

- Width: 15 m, dip: 50°



Conceptual models: Cross-cutting sand injectites

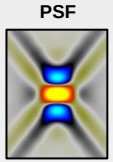
- Width: 15 m, dip: 30°



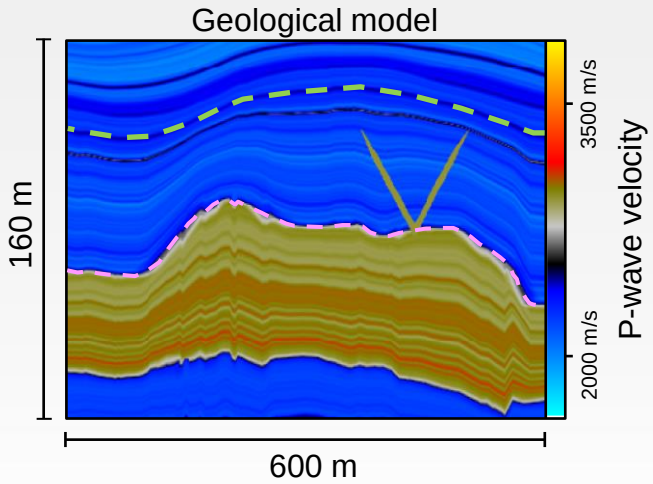
V-shaped sand injectites

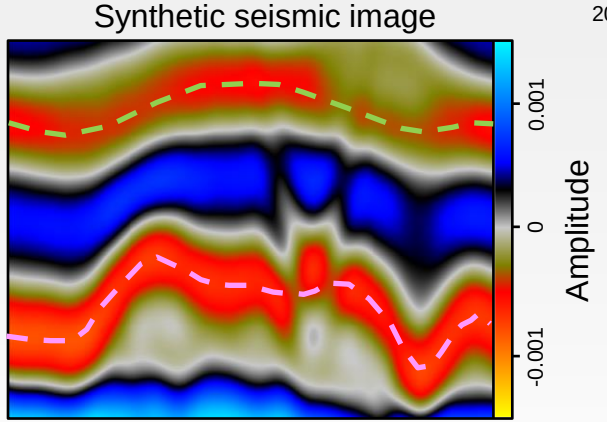
Conceptual models: V-shaped sand injectites

- Width: 5 m, dip: 50°



20 Hz, max.ill 45°

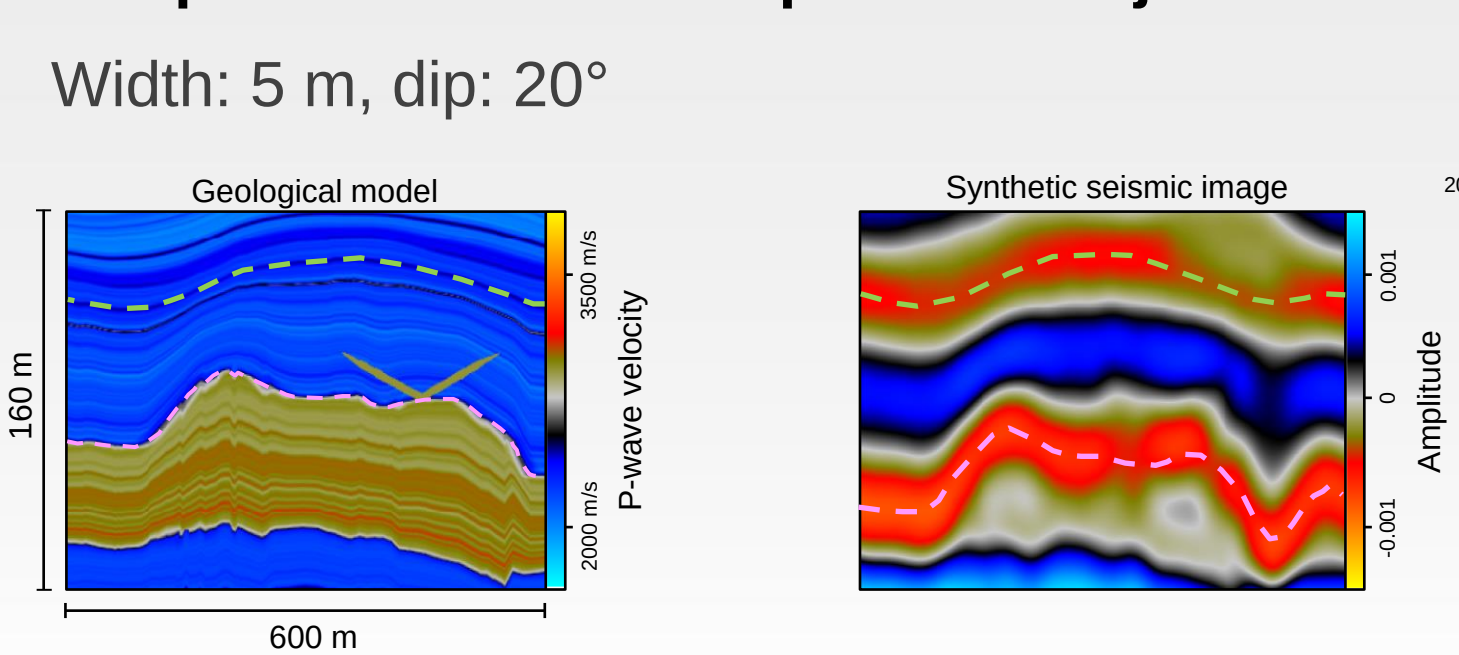




- Top reservoir - Top Sele

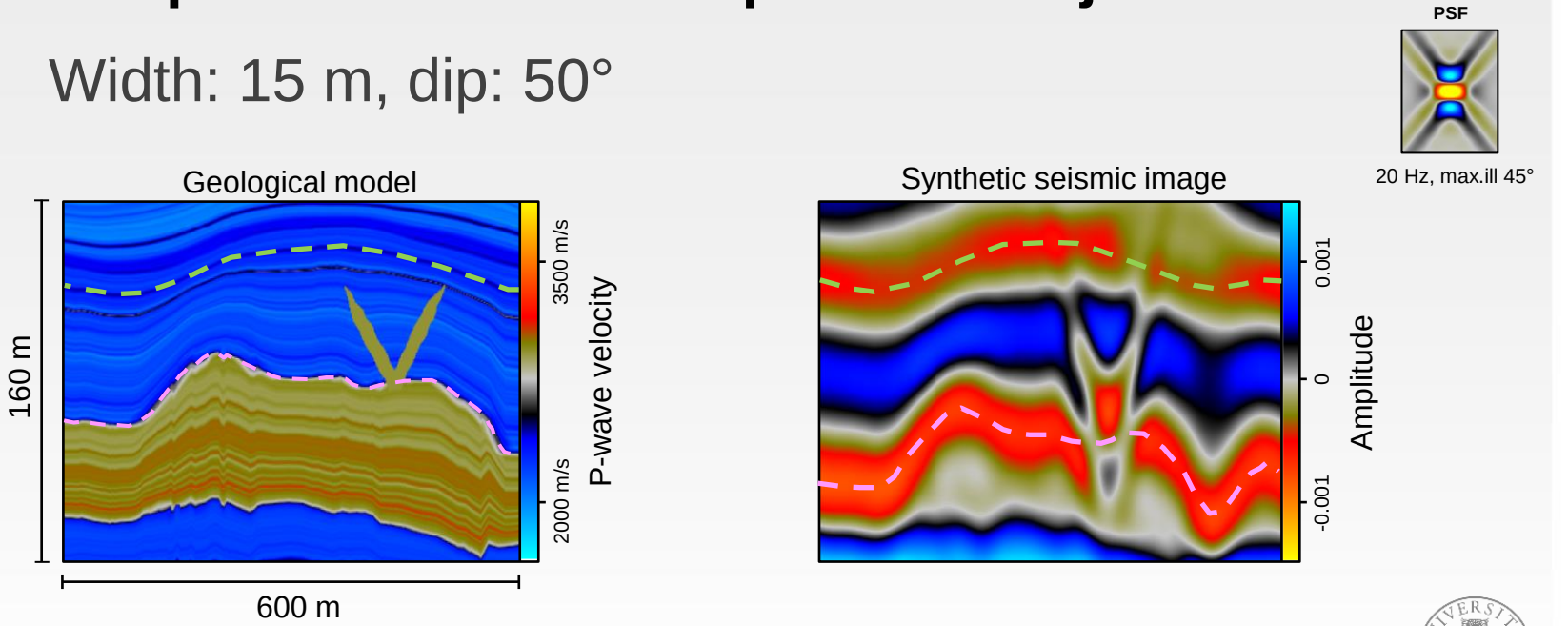
Conceptual models: V-shaped sand injectites

- Width: 5 m, dip: 20°



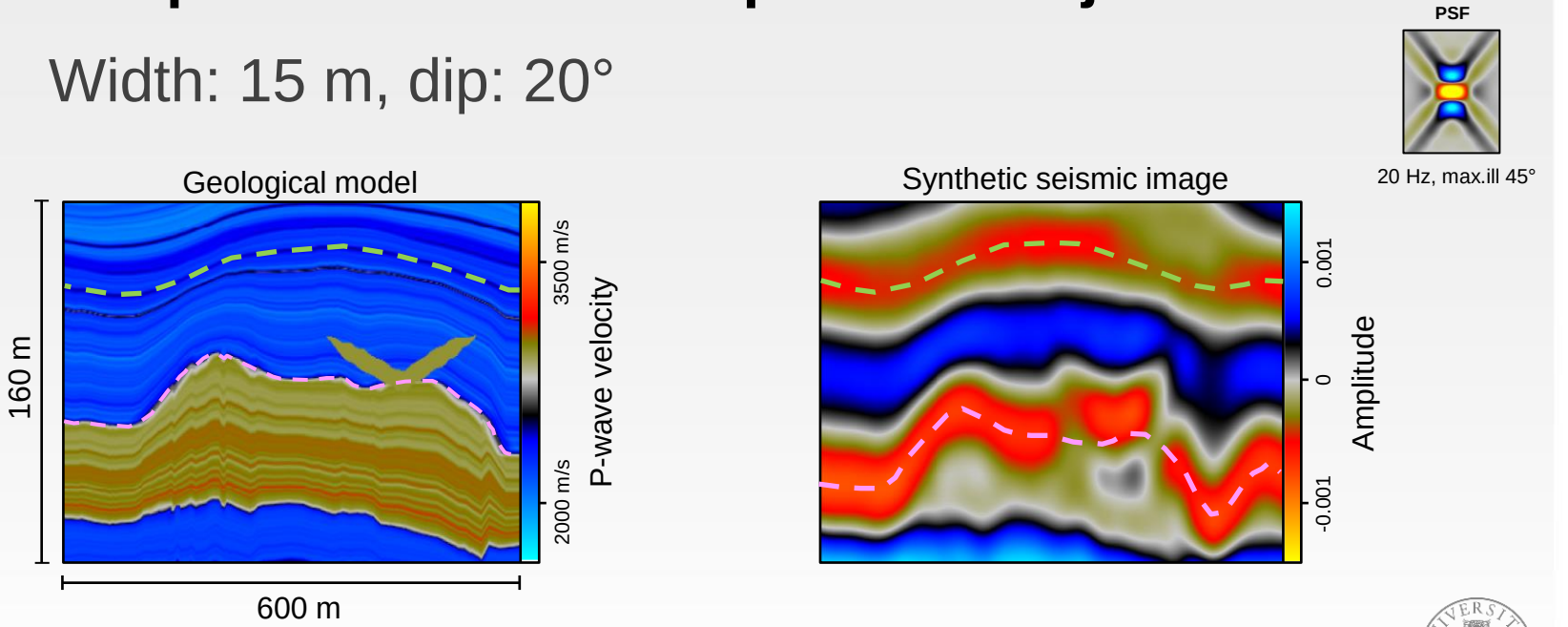
Conceptual models: V-shaped sand injectites

- Width: 15 m, dip: 50°



Conceptual models: V-shaped sand injectites

- Width: 15 m, dip: 20°



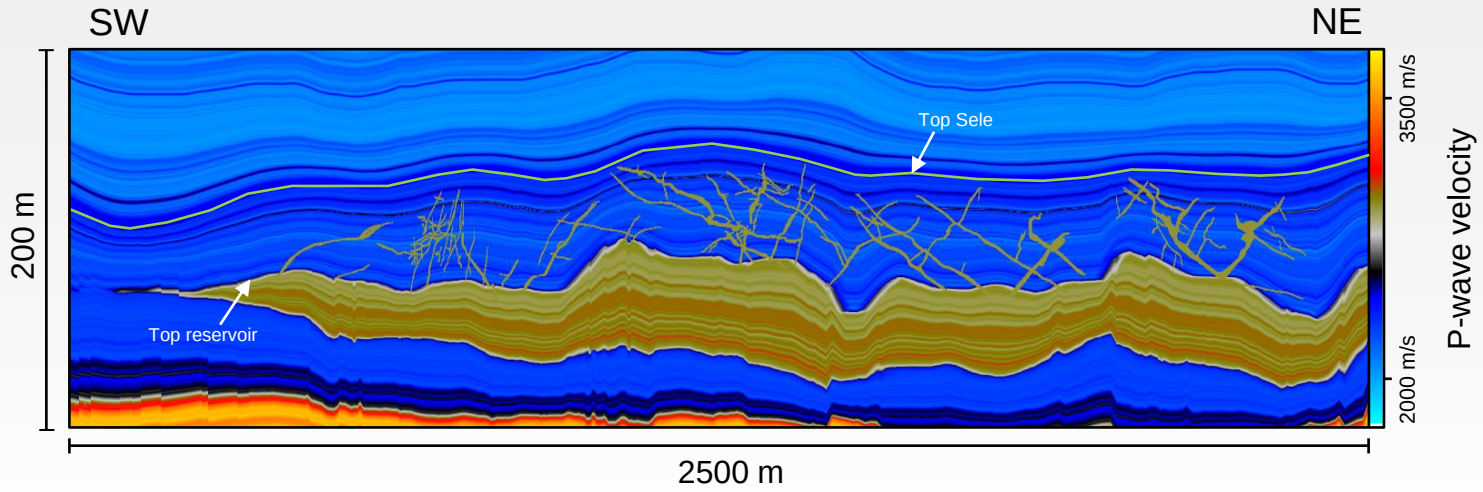
Realistic sand injectite models

- Sand injectite structures obtained from interpretations of outcrop analogues from the Panoche Hills (USA) and emplaced above the Grane reservoir

Model 1

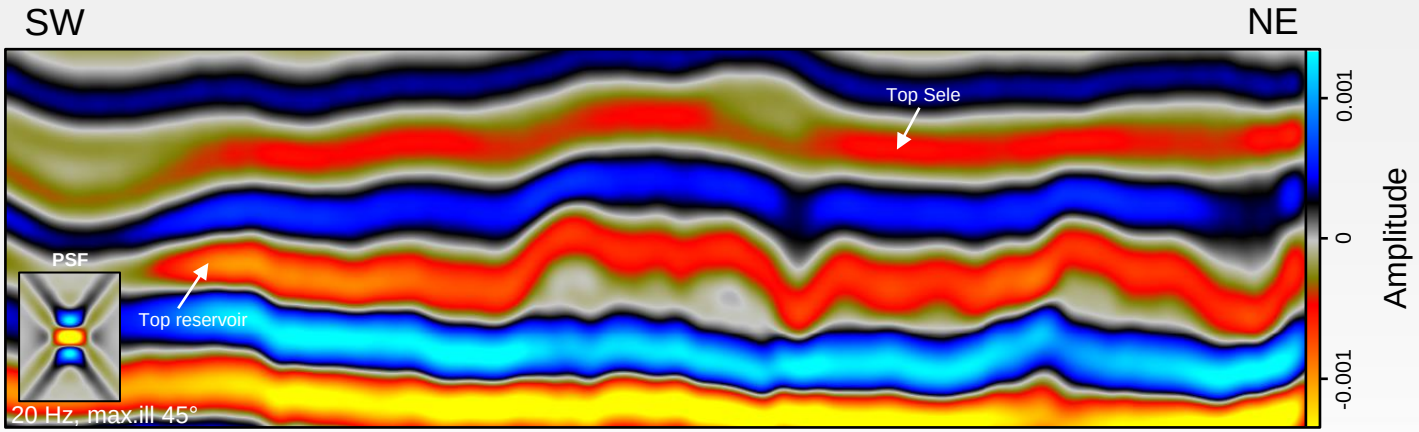
Realistic sand injectite models: Model 1

- Geological input model



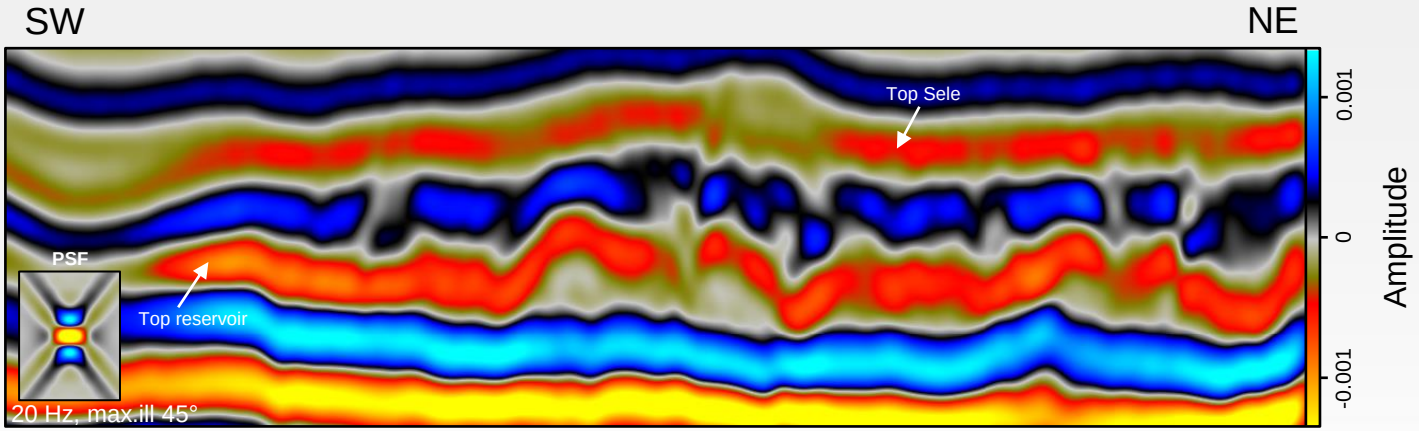
Realistic sand injectite models: Model 1

- Synthetic seismic image without sand injectites above the reservoir



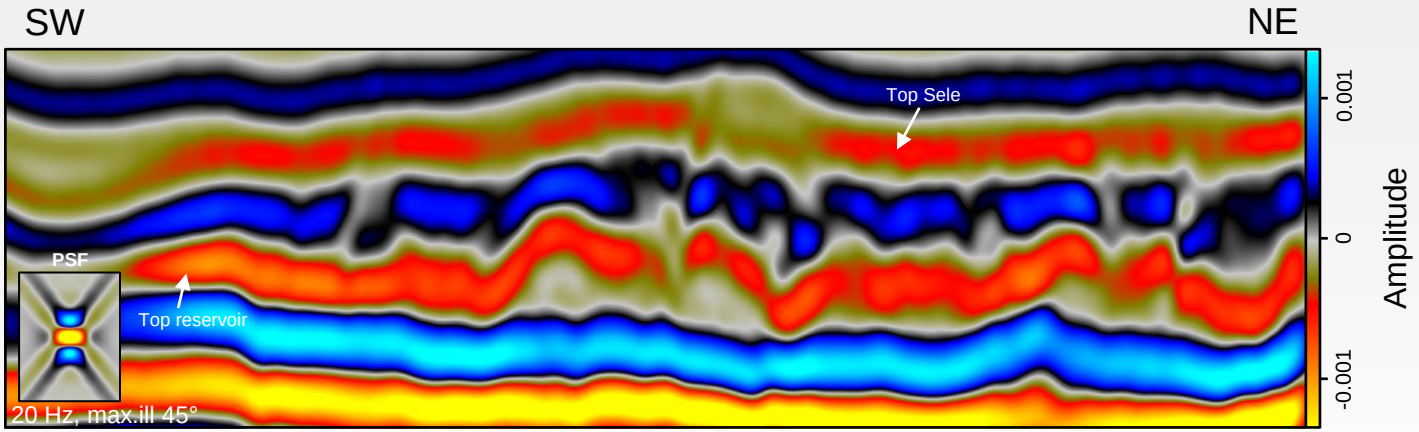
Realistic sand injectite models: Model 1

- Synthetic seismic image with sand injectites above the reservoir

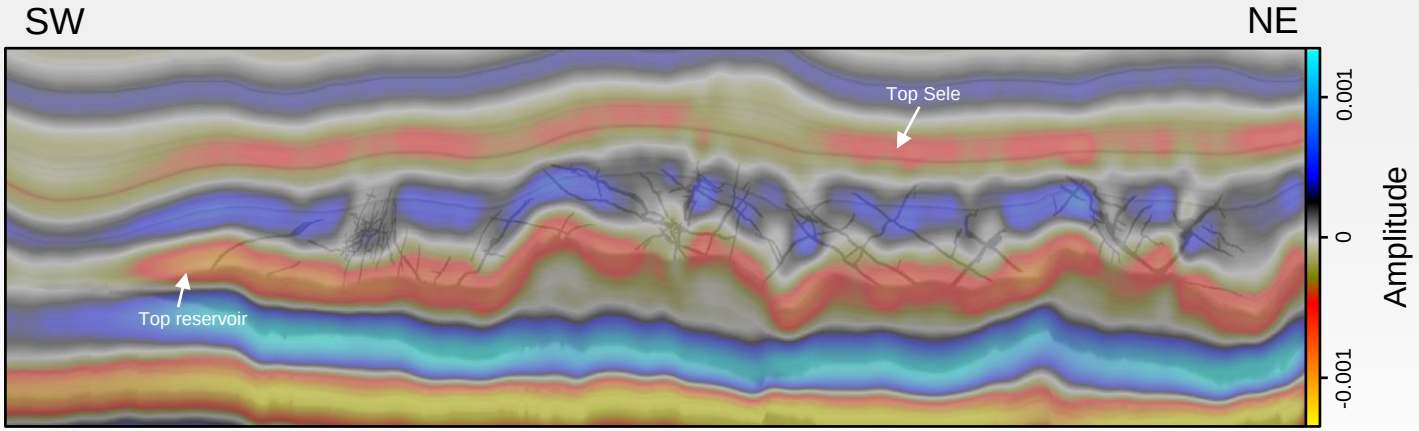


Geological model superimposed onto the synthetic seismic image of Model 1

Realistic sand injectite models: Model 1



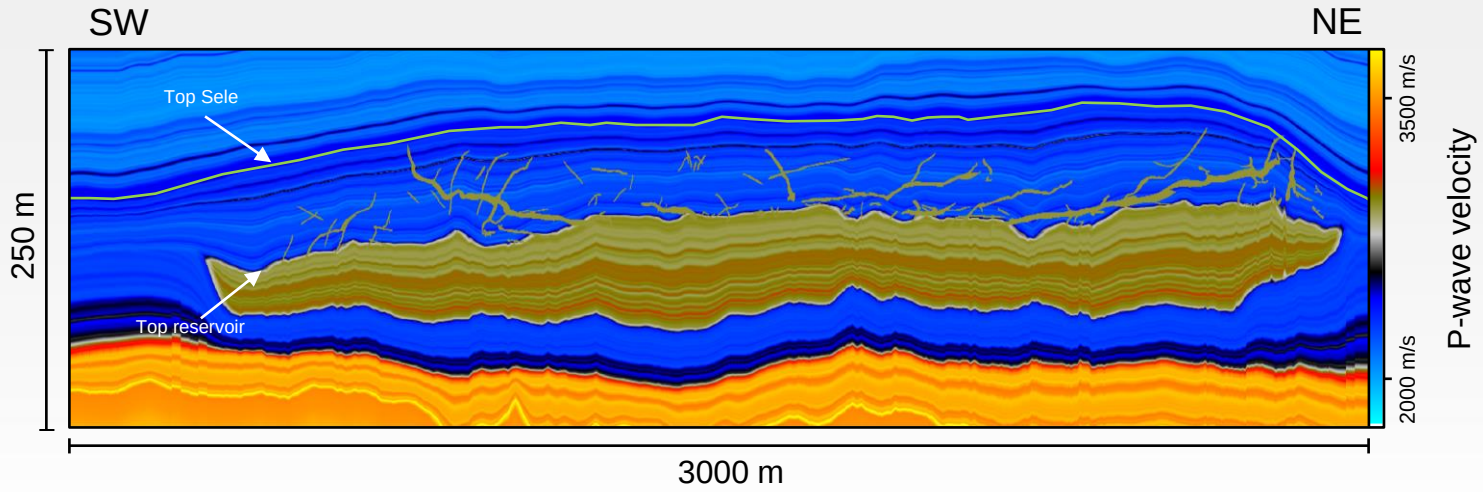
Realistic sand injectite models: Model 1



Model 2

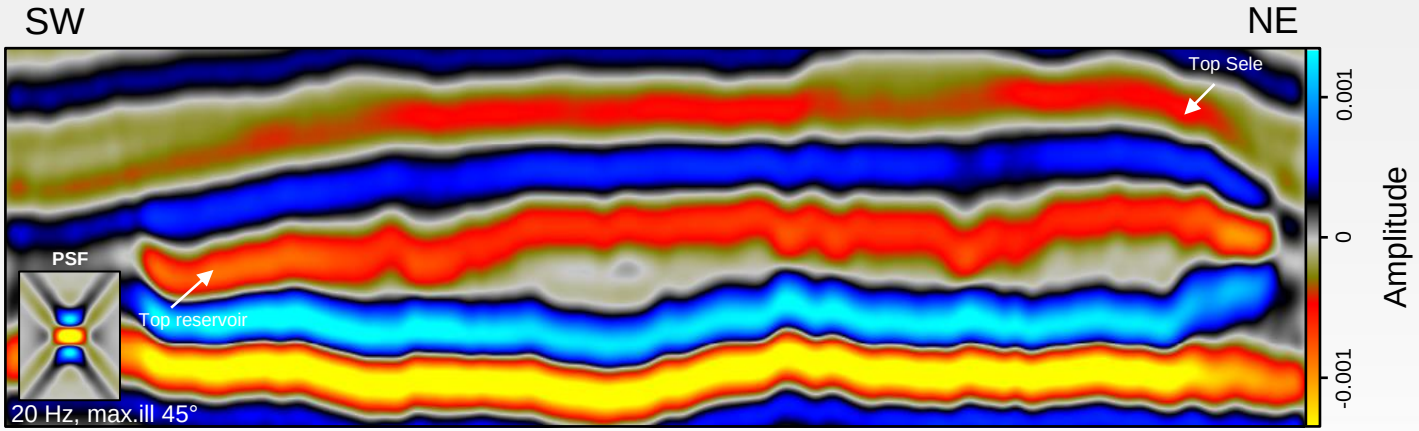
Realistic sand injectite models: Model 2

- Geological input model



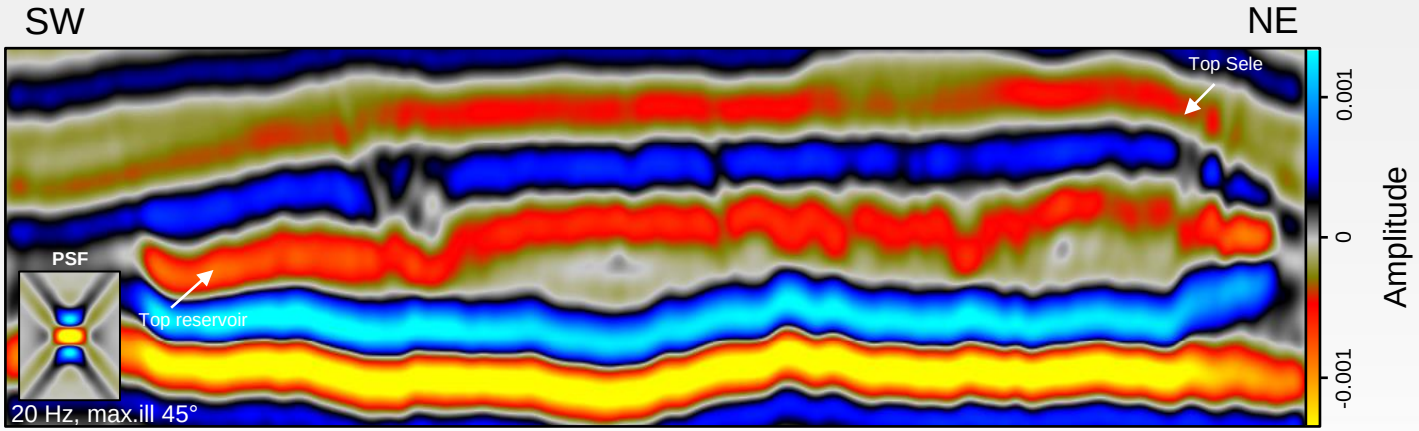
Realistic sand injectite models: Model 2

- Synthetic seismic image without sand injectites above the reservoir



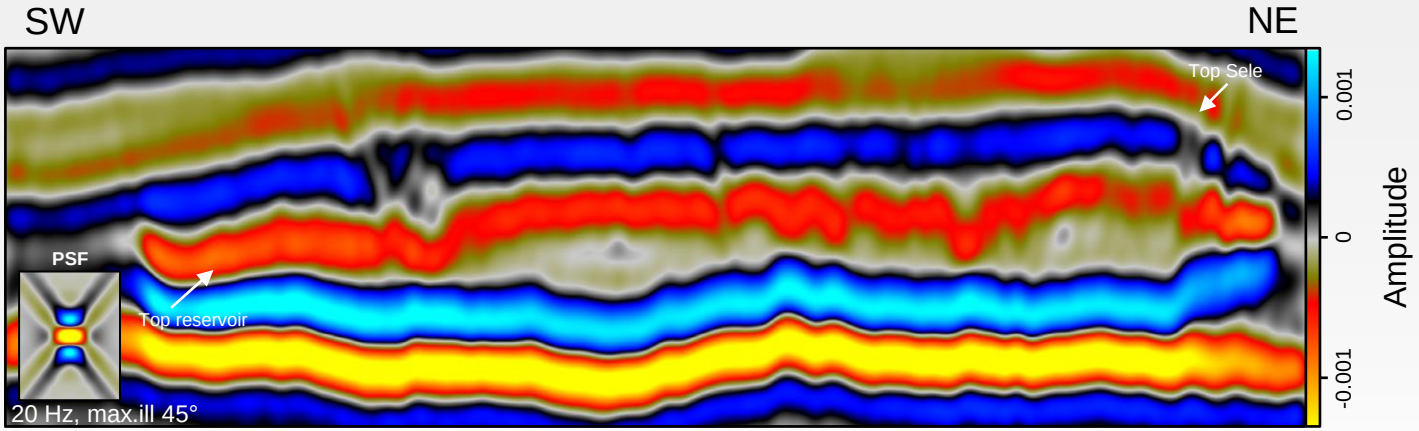
Realistic sand injectite models: Model 2

- Synthetic seismic image with sand injectites above the reservoir

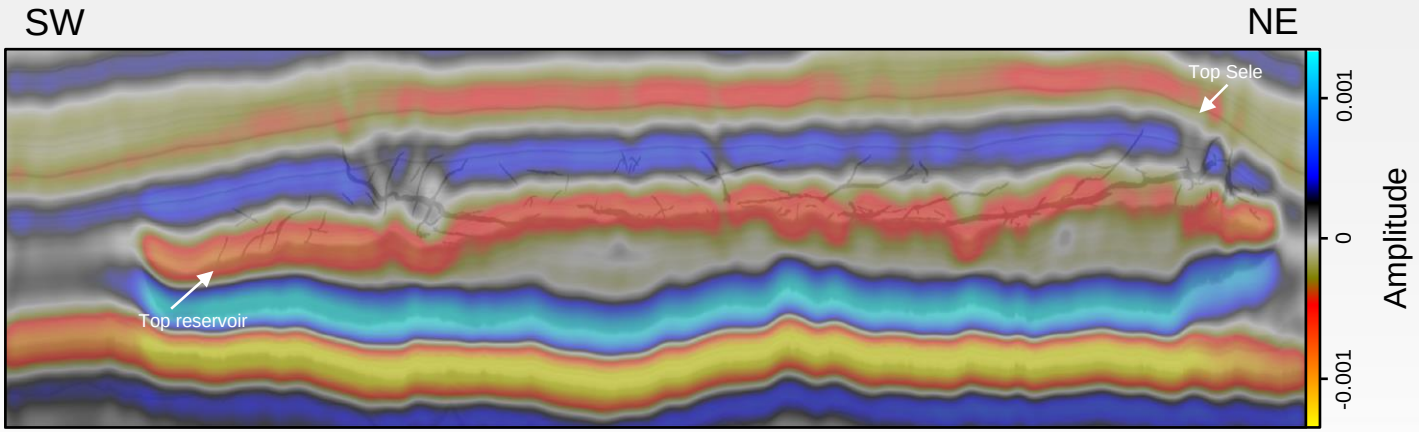


Geological model superimposed onto the synthetic seismic image of Model 2

Realistic sand injectite models: Model 2



Realistic sand injectite models: Model 2

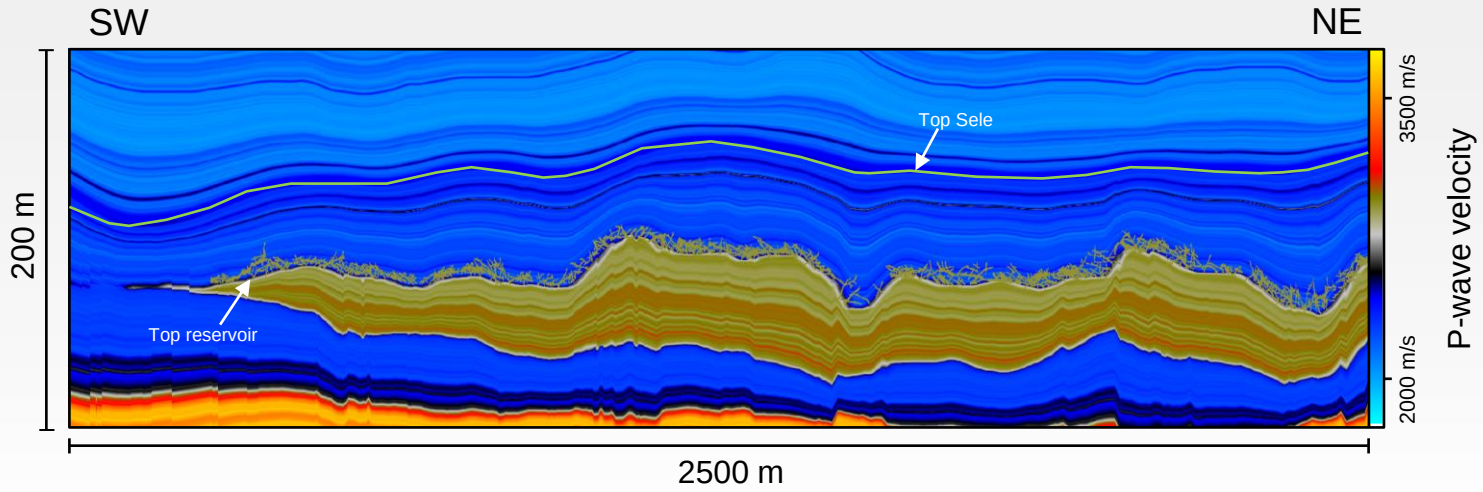


Sand injectite models at thicknesses comparable to well observations from the Grane Field (North Sea):

- The sand injectite structures from Panoche Hills (USA) are downscaled according to well observations from the Grane field
- The structures have thickness from 0-0.5 m and located within a distance of 0-10 m from the top reservoir.

Grane model 1

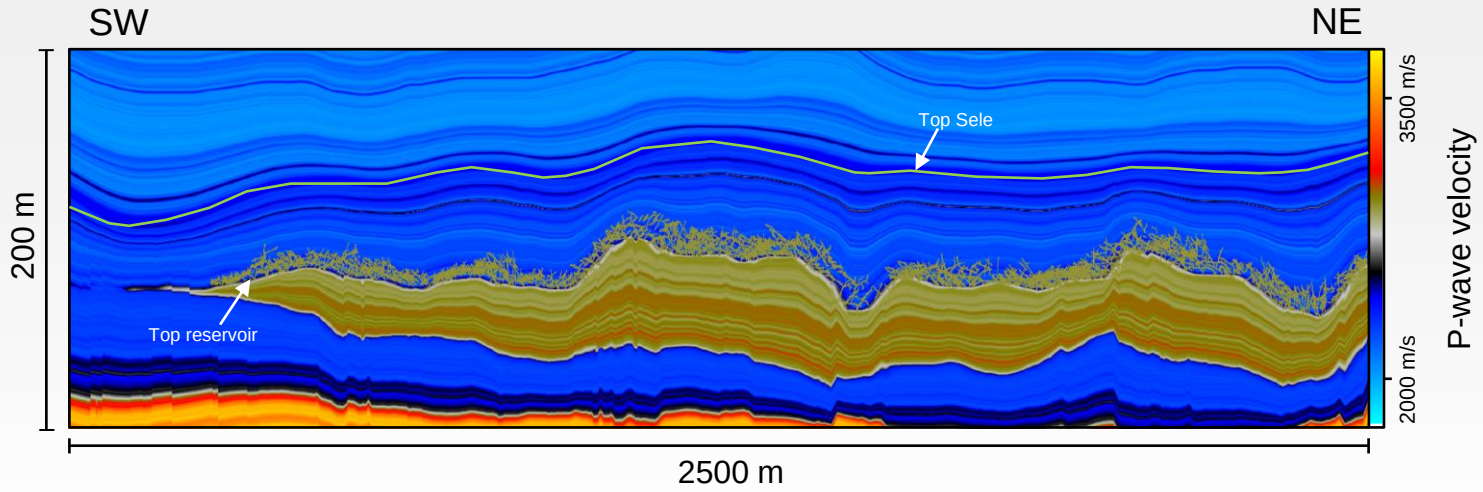
- Geological input model



Grane model 2

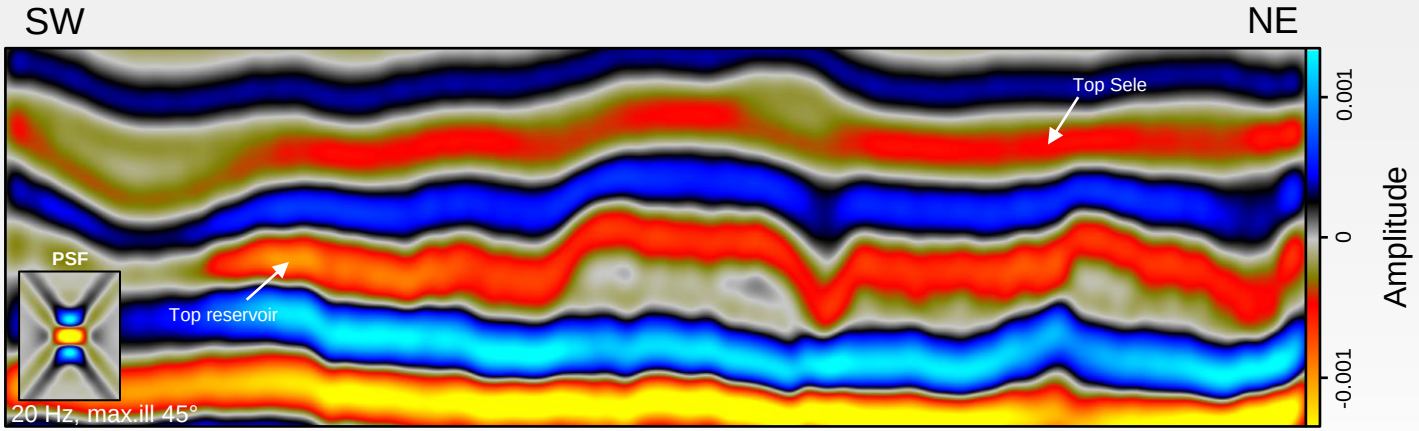
- Geological input model

  (number of sand injectites doubled from Grane model 1)



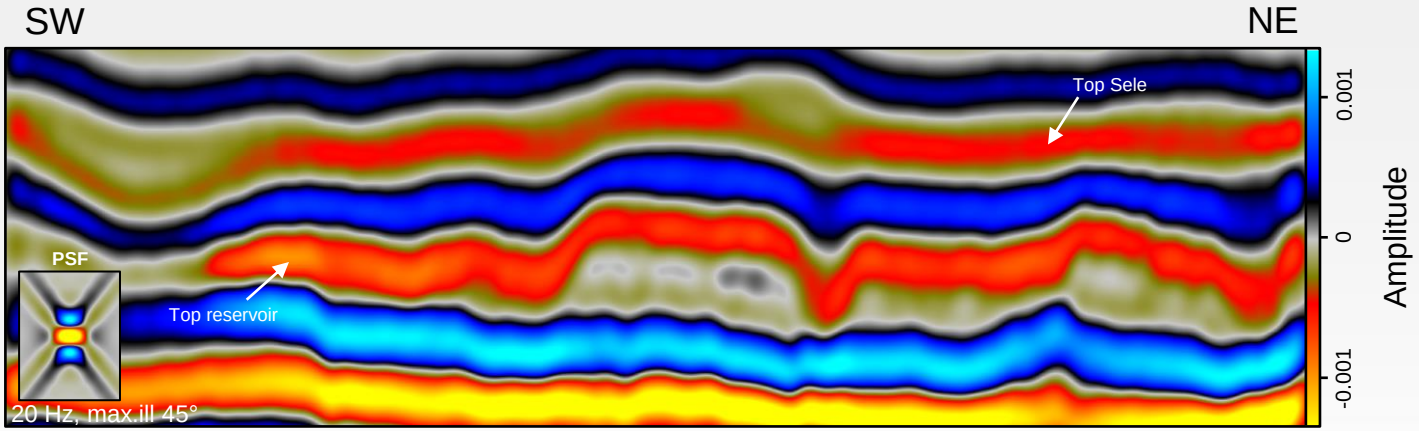
Grane model 1

- With sand injectites above the reservoir



Grane model 2

- With sand injectites above the reservoir



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