

Numerical modeling of various ice formations in north seas and their influence on seismic replies

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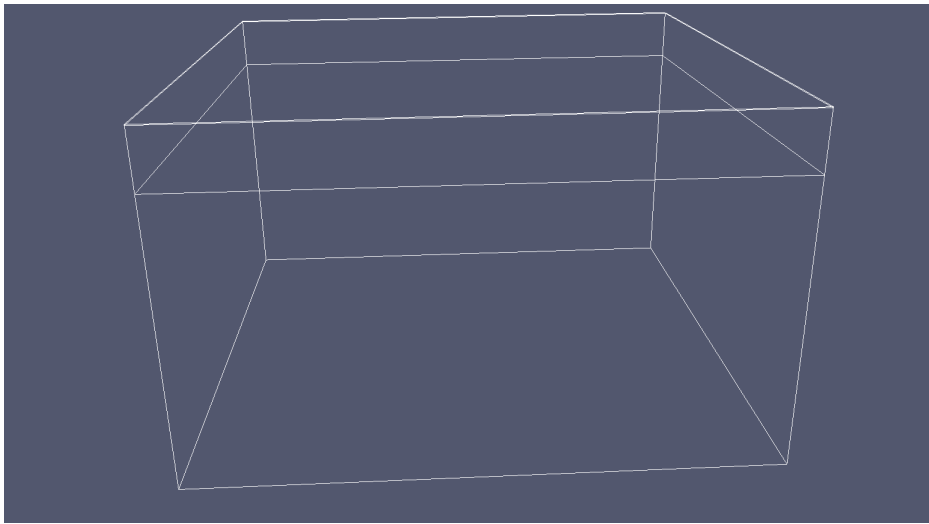
Plan

- Research of seismic replies in north seas with ice cover and oil slice (without oil slice)-different models
- Research of seismic replies in north seas with icebergs and oil slice (without oil slice)-different models
- Research of seismic replies in north seas with toros and oil slice (without oil slice)-different models

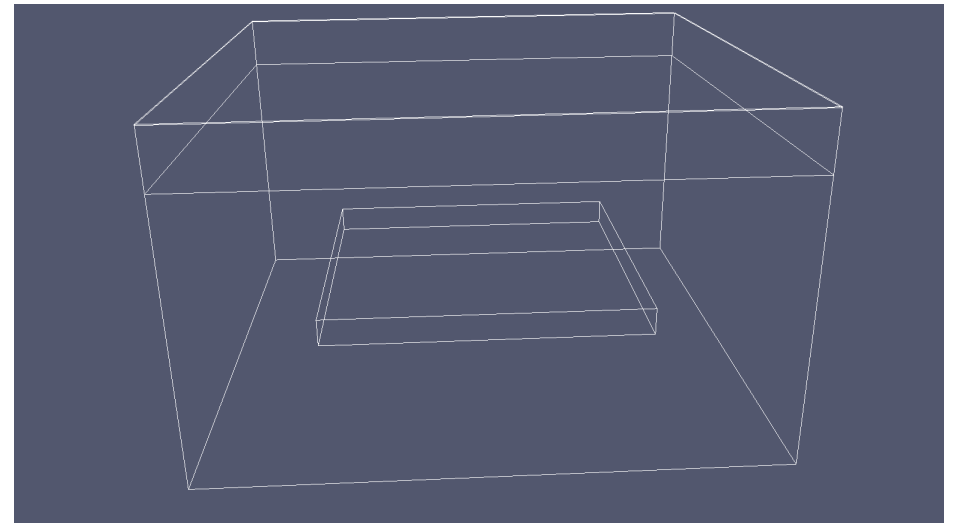
General parameters of models

- Space step: 1 m
- Time step: 10^{-4} sec.
- Number of steps in time: 60000
- Area of integration: 4000 m^2
- On all sides of area calculated - unreflecting boundary conditions
- Source of impulse-on the surface of integrated area in the centre
- Receivers of impulse-on the bottom of the sea

Models with ice cover

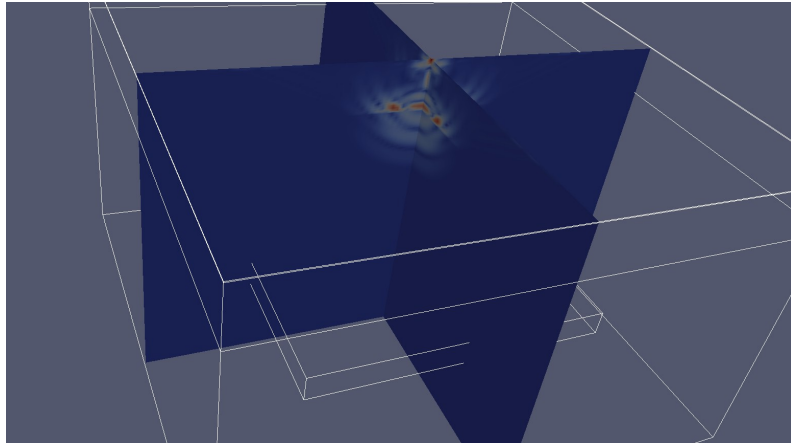


Model without oil

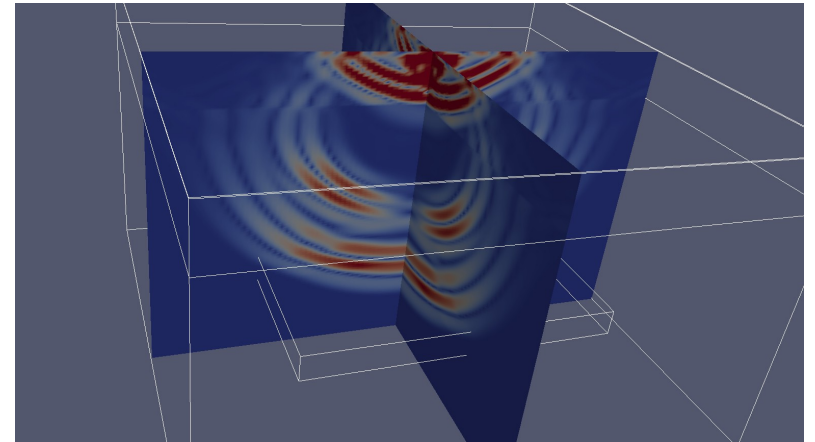


Model with oil

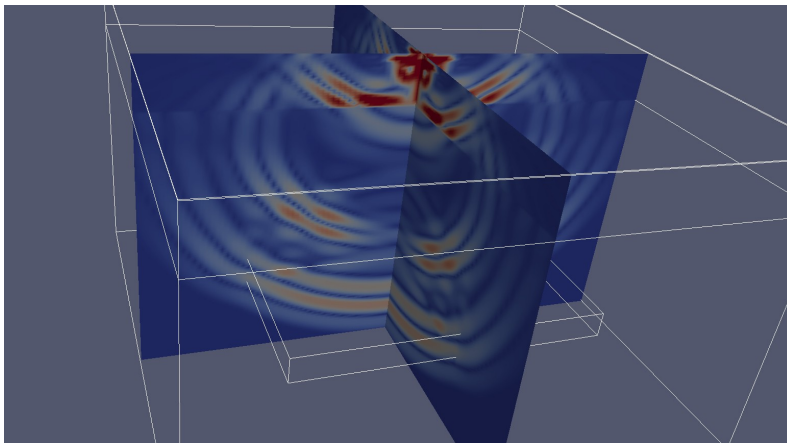
Wave patterns for models with ice cover



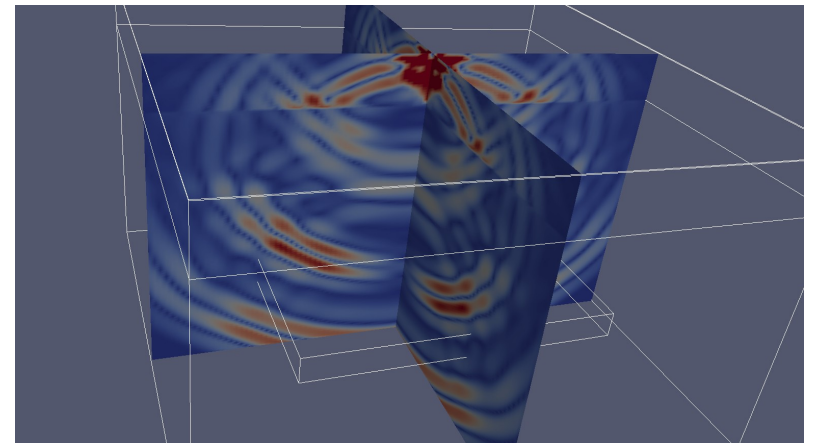
Time 0.18 sec.



Time 0.38 sec.

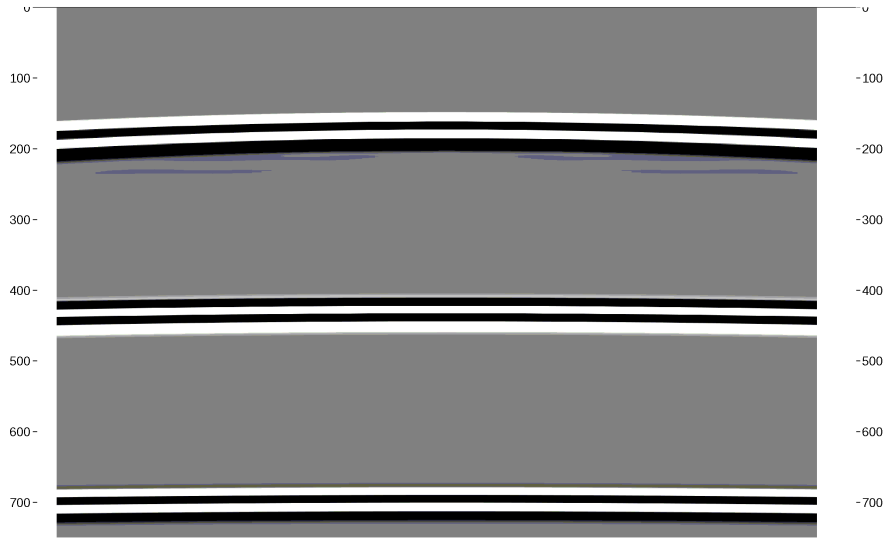


Time 0.44 sec.



Time 0.52 sec.

Seismograms for models with ice cover

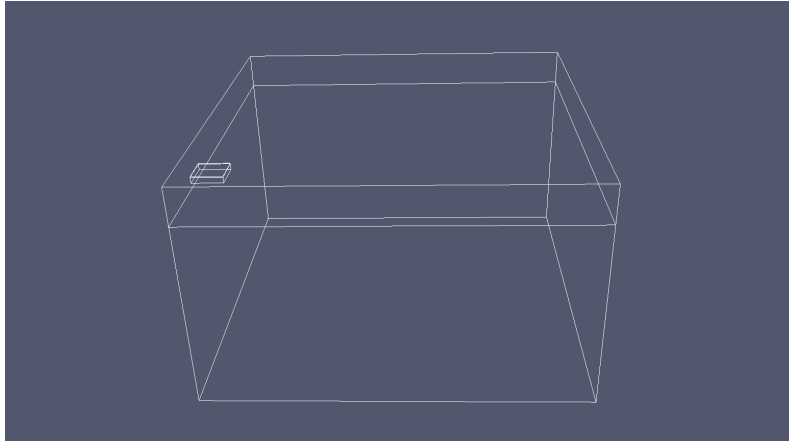


Model with oil

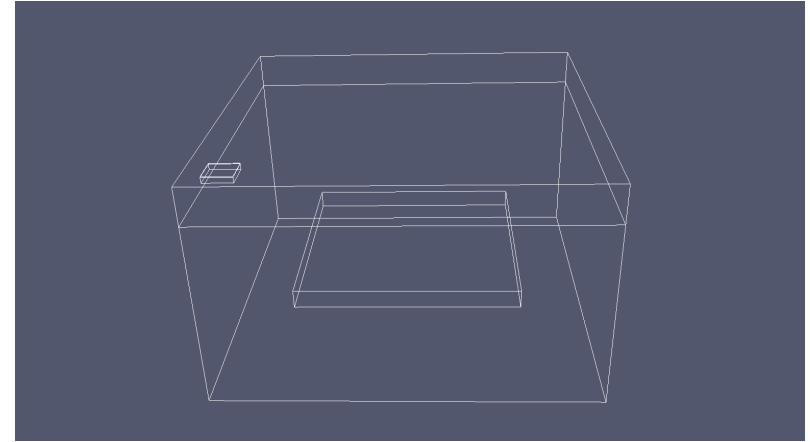


Model without oil

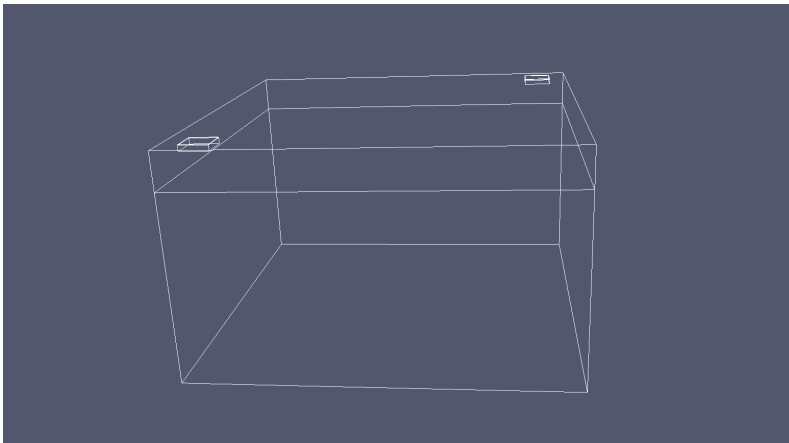
Models with icebergs



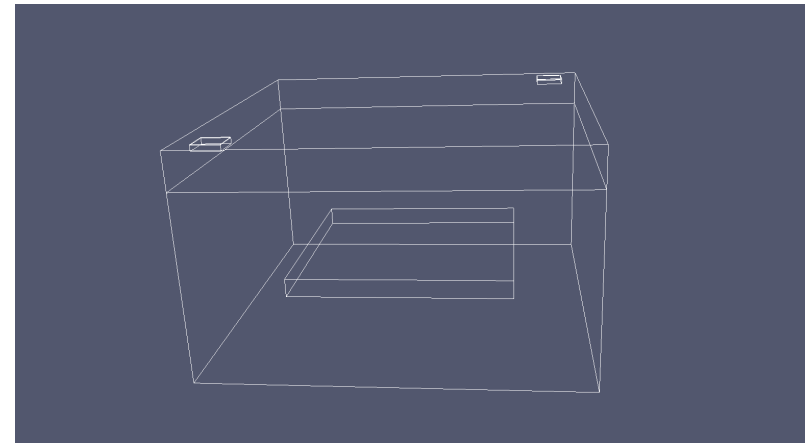
Model with 1 iceberg without oil



Model with 1 iceberg with oil

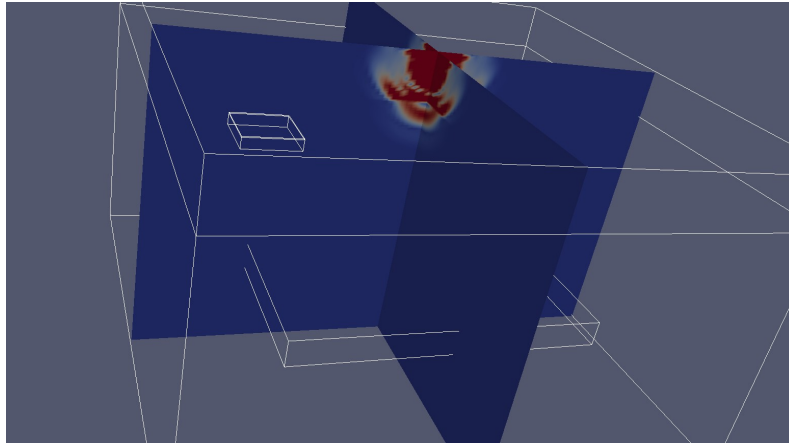


Model with 2 icebergs without oil

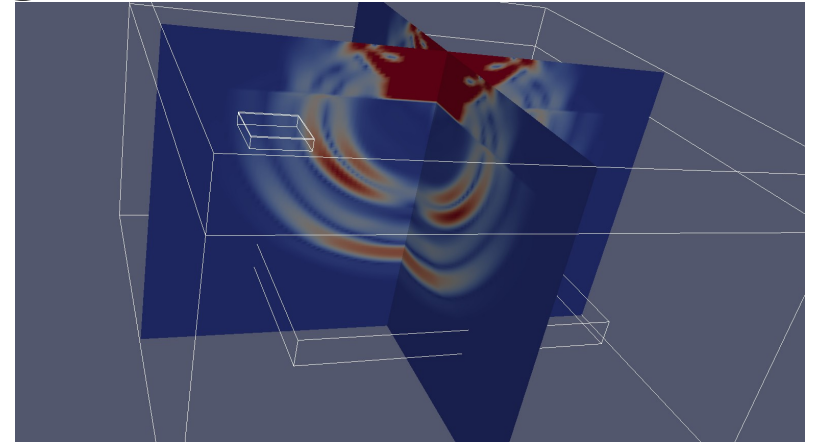


Model with 2 icebergs with oil

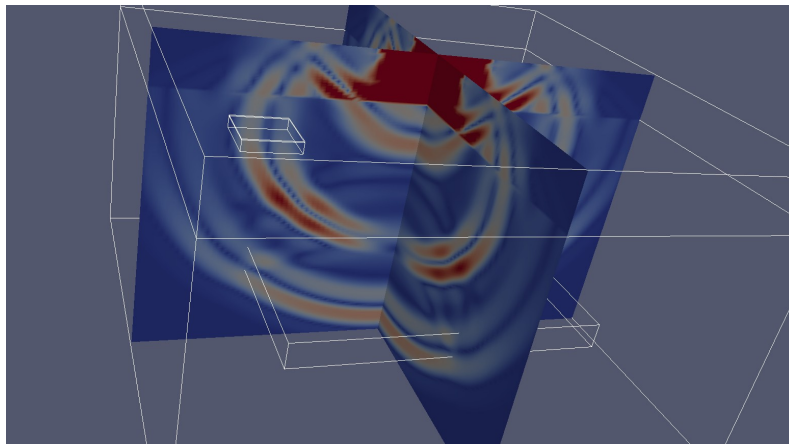
Wave patterns for models with 1 iceberg



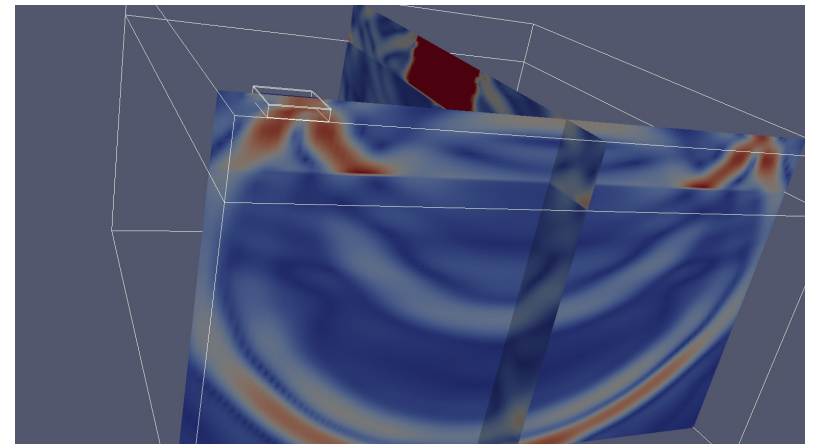
Time 0.15 sec.



Time 0.35 sec.

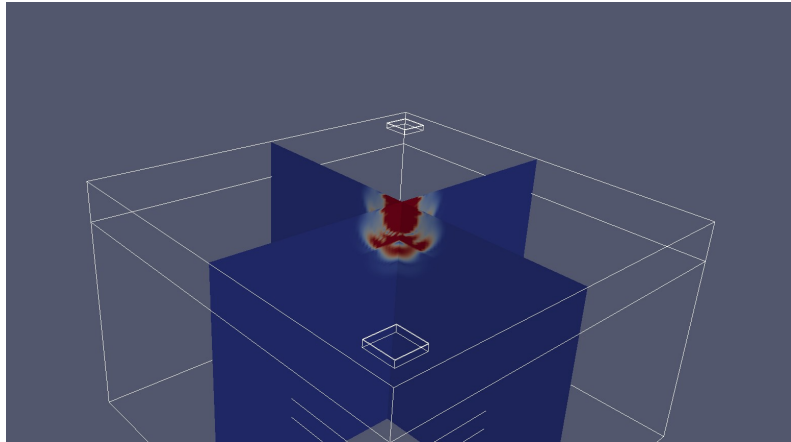


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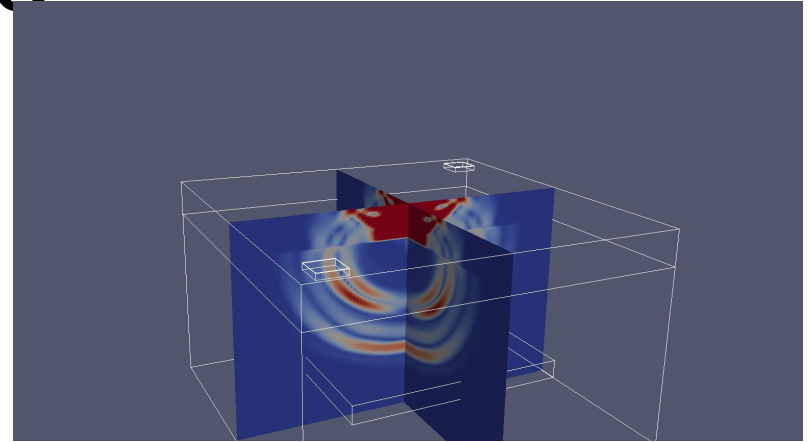


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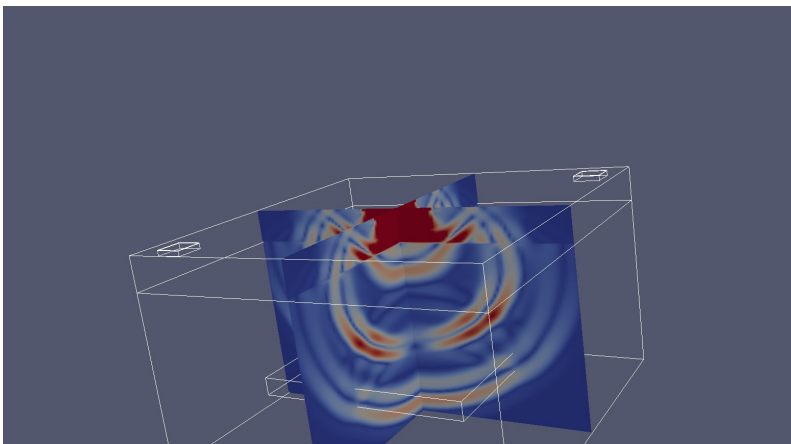
Wave patterns for models with 2 icebergs



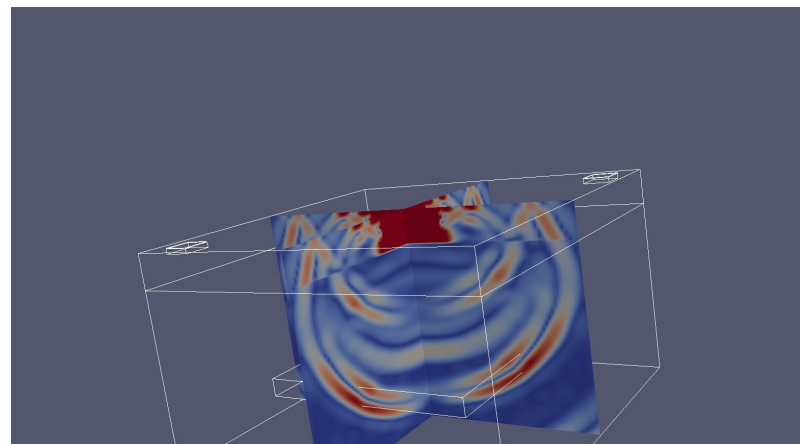
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Time 0.35 sec.

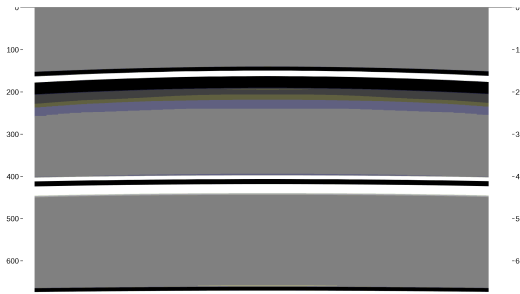


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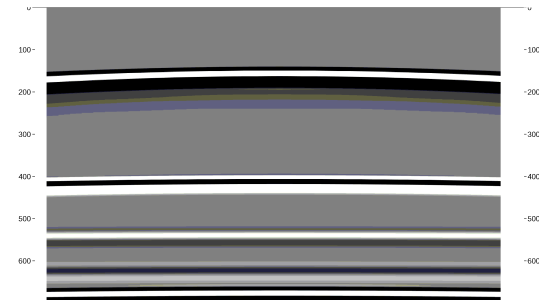
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Seismograms for models with icebergs

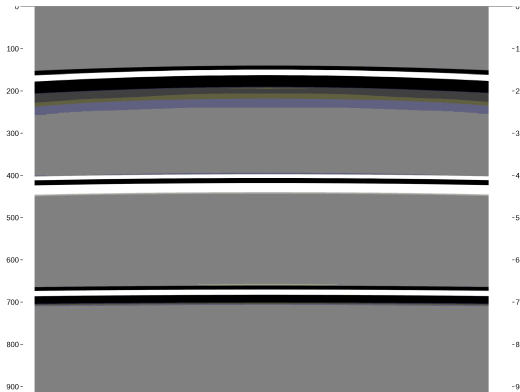


Without oil

1 iceberg

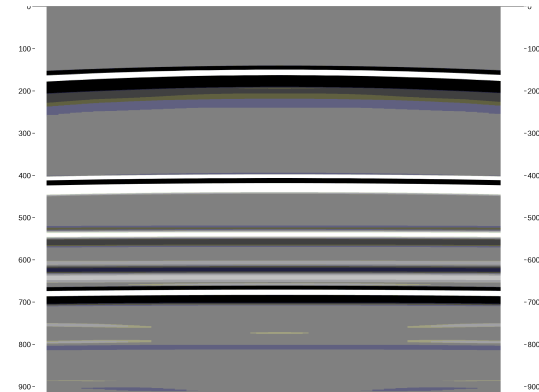


With oil



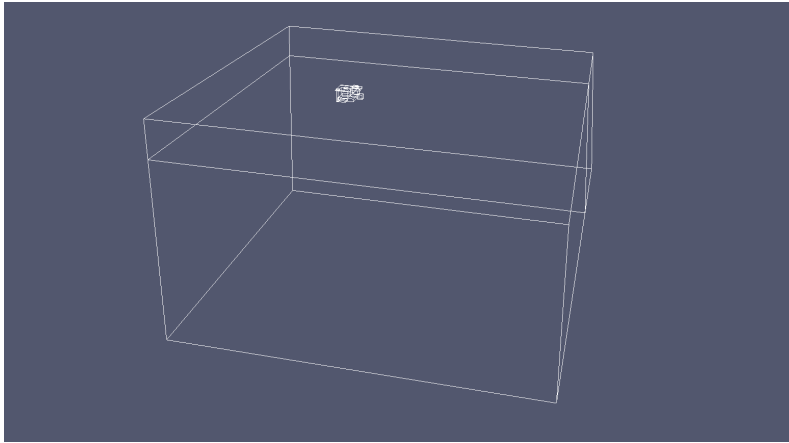
Without oil

2 icebergs

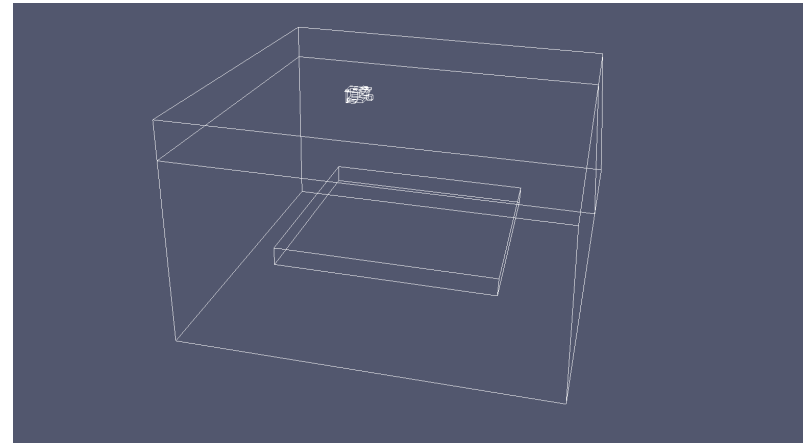


With oil

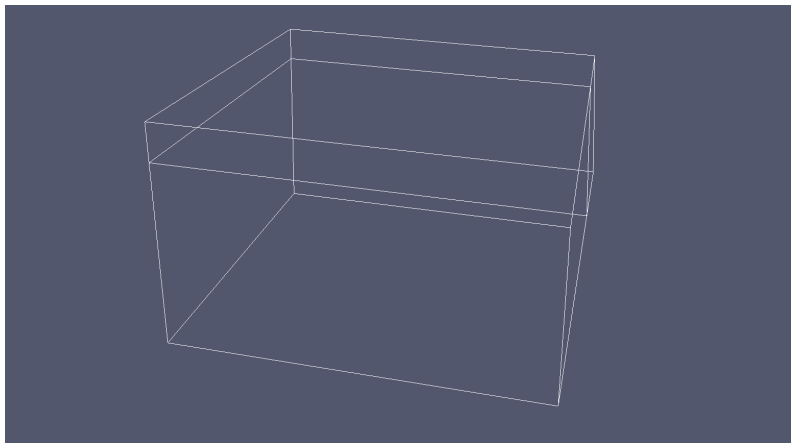
Models with toros



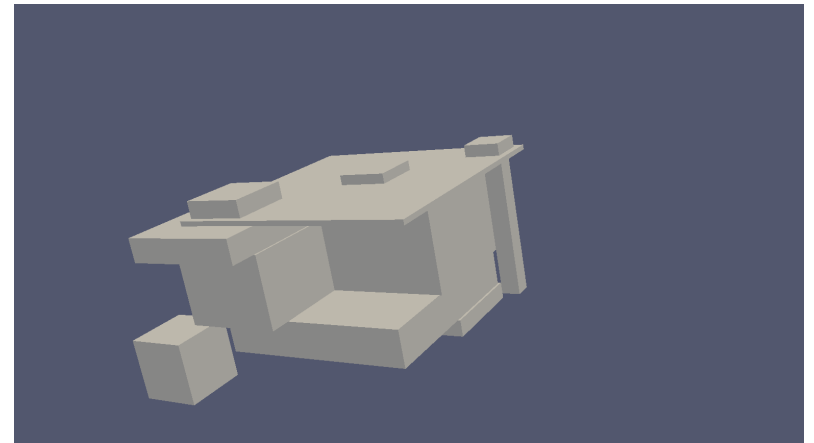
Model with toros without oil



Model with toros with oil



Model without toros and without oil

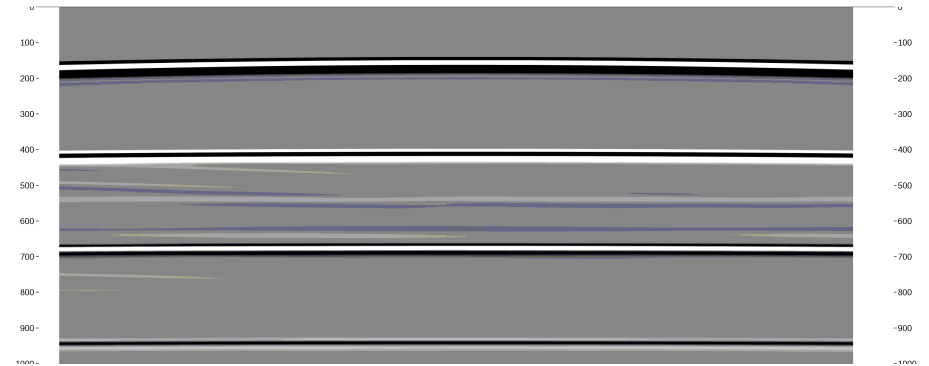


Model of toros

Seismograms for models with toros



Model with toros without oil



Model with toros with oil



Model without toros and without oil

Conclusions

- Modelling and analysis of seismic replies in seas with (or without) the presence of different ice formations have been conducted
- Appropriate seismograms of replies from the oil slice have been built

Thank you for attention!