

## Marine CSEM: The airwave and how it can be removed

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In Controlled Source Electromagnetics (CSEM) in a marine environment, one is interested to detect resistors, e.g., hydrocarbon reservoirs, in the subsurface. However, the recorded signal is strongly affected by the airwave, which consists of energy refracted at the air-water interface, traveling through the air with the speed of light and transmitting continuously energy down into the water (Amundsen *et al.*, 2006). Since this airwave produces a strong signal, but does not contain any information about the subsurface, one wants to eliminate it from the data during processing. The following possibilities to remove the airwave exist:

- Modeling and Subtraction (Nordskag & Amundsen, 2007)
- Filtering (Ziolkowski & Wright, 2007)
- Wavefield Decomposition (Amundsen *et al.*, 2006)
- Interferometry (Wapenaar *et al.*, 2008)
- Vertical sources and receivers Holten *et al.* (2009)

We give an overview over these methods and investigate the dependence of the airwave on the receiver-antenna orientation relative to the source-antenna. The latter is achieved by analytical modeling of the diffusive field in a model consisting of two halfspaces. With our approach it is possible to model virtually any antenna orientation.

### References

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