

*PETROLEUM EXPLORATION IN SUBANDEAN BASINS*  
*“Knowledge Integration - The key to success”*

**Ghost-free seismic acquisition - a step change in data resolution and interpretability**

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Ghost notches for both the source and receiver towing depth affect marine streamer data. Shallow towing depths are sometimes used to increase the high frequency content. The shallow tow depth penalizes however the lower frequencies. Conversely, towing deeper will better preserve lower frequencies, but will penalize the higher frequencies.

In 2007, the problem of the receiver ghost in marine seismic acquisition was addressed by the launch of a towed dual-sensor marine streamer. In 2011, the streamer technology was complemented by a new marine source concept. Seismic acquisition with a time and depth distributed source configuration enables the removal of the ghost on the source side. By operating these two technologies in partnership, both source and receiver ghosts can be eliminated robustly. The resultant ghost-free source signature can now be removed in a deterministic way. At this stage, the nature of the Earth's attenuation clearly is visible and can be compensated for. This leads to ghost-free, broadband data revealing the true earth response. Removal of both the source and receiver ghosts at an early stage in the preprocessing sequence, offers advantages for subsequent processing steps including de-multiple, velocity analysis, and imaging and produces high-quality prestack as well as post-stack data.

In this presentation, we will explain the concept of ghost-free seismic acquisition and processing. Several case studies will be presented. Comparisons with conventional data will be made. These comparisons show the effect of removing the various responses imposed by the acquisition system and earth filtering effects. Images resulting from ghost-free seismic data are clearly better focused and show much more geological detail.