

# One-way active tracking in the INTIMATE 96 experiment

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Portable array from SACLANTCEN

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# Outline

- *Experimental scenario* showing the source ship and the vertical receiving array.
- *Bathymetry and source track*. There is about 20 m of variation in the bottom depth.
- *CTD data* over a tidal cycle at the vertical array. There is significant variability.
- *Eigenrays* connecting the source at 90 m to the lower phone.
- *Spectrograms* on the 4 phones of the array. 2 second chirps were transmitted every 8 seconds for several days.
- *Correlogram* of the 14 hour period where the source ship traveled cross-slope and down-slope. A clear multipath structure is seen and the length of the response increases as the source moves away from the array.
- *Environmentally adaptive tracking* . The KRAKEN normal mode model was used to generate the replica field. Tracking is nearly perfect apart from some minor degradation as the source moves into deeper water. (A flat bottom model was used.)
- *Correlogram* for a 25 hour period while the source was on station. Undulations in the multipath structure correlate with the tides.
- *Environmentally adaptive tracking* for this period. There is a small apparent range wander which correlates with the tides.

# Summary

- The acoustic data shows a clean *multipath* structure warped in time by the tides.
- Ray, mode, FFP models all provide a *precise prediction* of the arrival structure.
- The source is *tracked continuously* over several days as it moves to and from the array both cross-slope and down-slope.
- Tides cause a small wobble in apparent target range.
- Flat-bottom model leads to a *small range error* when the source moves down-slope.