SnT 2025 8 SEPTEMBER ONLINE DAY 9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

Acoustic detection of a maritime accident: The case of MOL Comfort

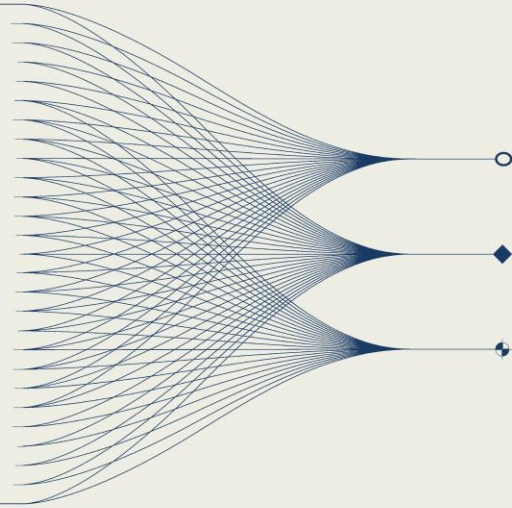
D Metz & T C A Oliveira

Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)

CTBTO PREPARATORY COMMISSION

INTRODUCTION AND MAIN RESULTS

- The sinking of a surface vessel has been detected for the first time by an IMS hydrophone station
- Time and back azimuth of acoustic phases match reported information and onsite observations
- IMS hydrophone data may prove useful in cases where ship-based telemetry or communication logs are unavailable or inconclusive



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Photographs: MRCC Mumbai, Indian Coast Guard.
https://gcaptain.com/mol-comfort-incident-photos/

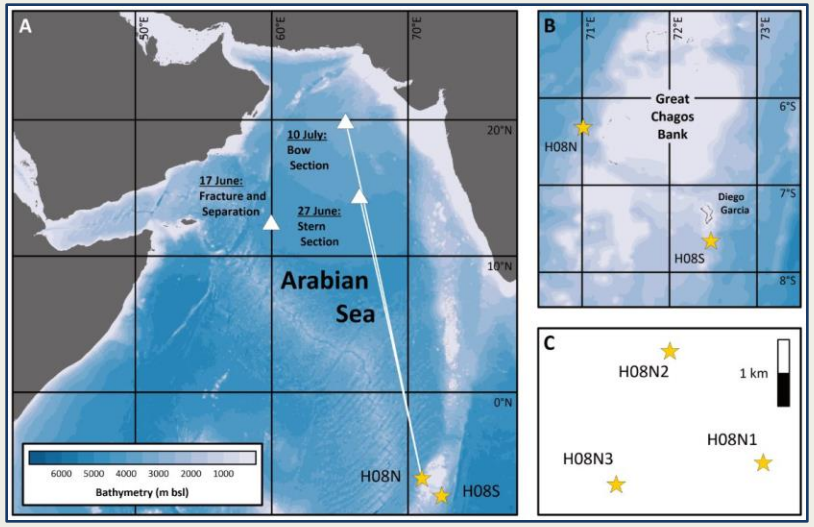
Introduction

En route from Singapore to Jeddah, MOL Comfort suffered a crack amidships on 17 June 2013 and broke into two parts, a stern and a bow section. The crew evacuated without loss of life; the two sections sank despite salvage efforts*:

- Stern: Circa 0745 UTC, 27 June
- Bow: Circa 1900 UTC, 10 July

Motivation: Were these events recorded by IMS hydrophone sensors? The length of unblocked geodesic paths to H08N in the Chagos Archipelago are approximately:

- Stern: 2,352 km – TT: 26.5 min (at 1.48 km/s)
- Bow: 2,971 km – TT: 33.5 min (at 1.48 km/s)



*The Bahamas Maritime Authority (2015), Report of the investigation into the sinking of the MOL Comfort in the Indian Ocean

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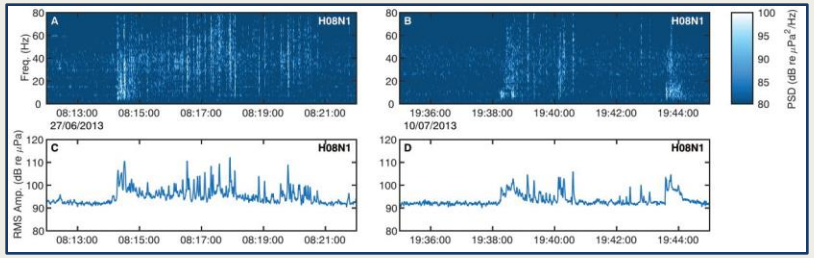
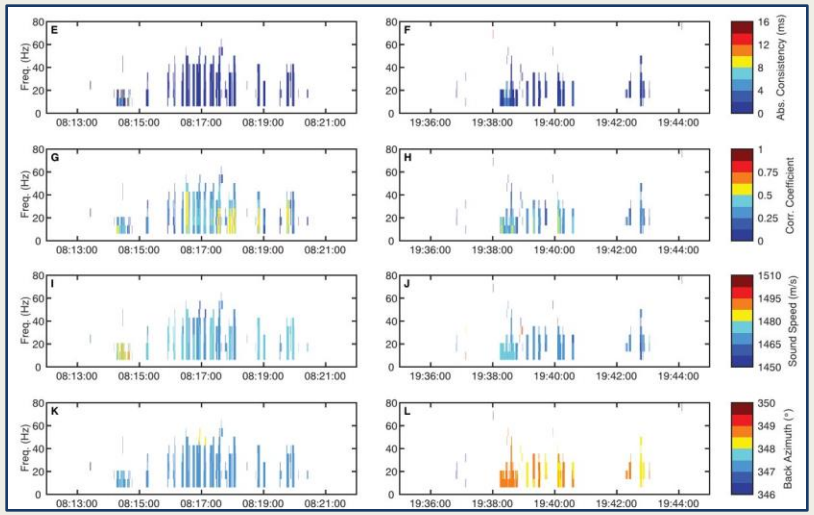
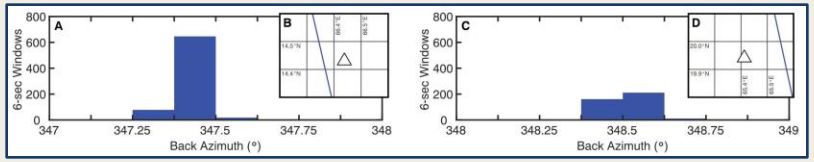
Waveform Data & H08N PMCC Results



5-10min long burst of short, impulsive, broadband signals recorded after the sinking of each section.



DTK-PMCC processing: 6-80 Hz (10 bands) in 6-sec windows.
Thresholds are ±16 ms consistency, 1480 ±30 m/s slowness.

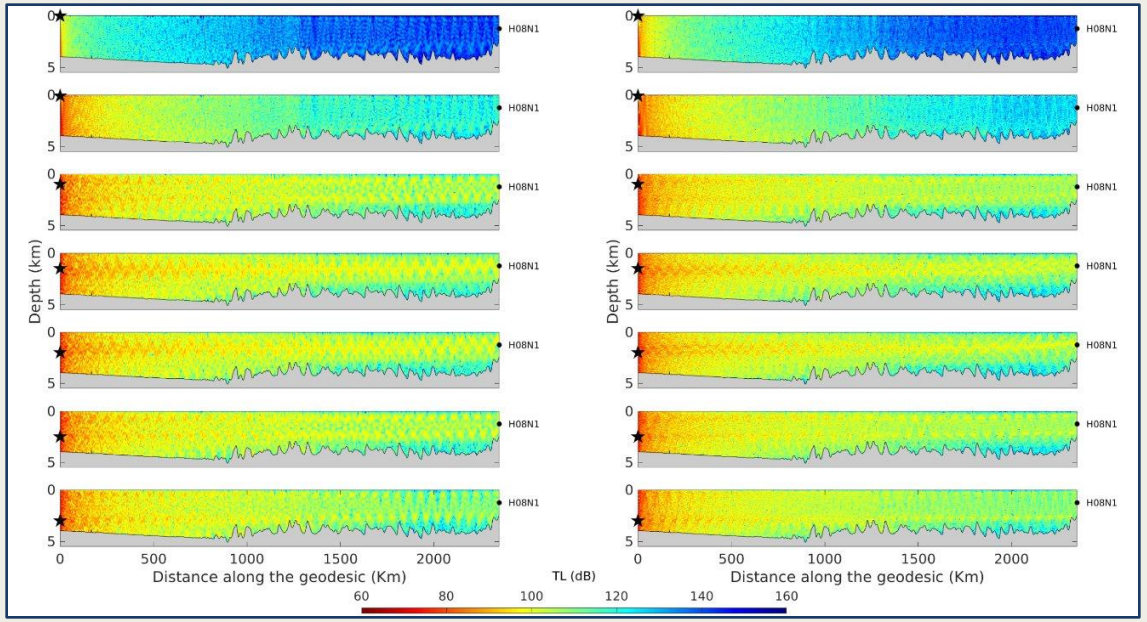


Mean back azimuths match the geodesic paths to within 0.3°.

Further Observations

- At least one H phase reported for each stern and bow sequence; no events built as arrivals limited to a single triplet
- No T phase arrivals were recorded at nearby seismometers; no tectonic activity reported in the area

Acoustic Modeling



10 (left) and 30 Hz (right) 3D PE scenarios for the case of the stern section; 10, 100, 500, 1000, 1500, 2000, 2500, and 3000 m simulated source depth (top to bottom)

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