ID: P1.3-858

# to Hydroacoustic Processing Utilizing Three-Dimensional Ocean Acoustic Propagation

Tuesday, 20 June 2023 09:13 (1 minute)

In support of the Comprehensive Nuclear-Test-Ban Treaty, the International Monitoring System (IMS) has implemented a set of deep water open ocean hydroacoustic stations for monitoring (detecting and localization) any nuclear tests. As acoustic propagation satisfies the acoustic wave equation sound is subject to threedimensional effects (refraction, diffraction, reflections) when in the presence of horizontal gradients due to bathymetry, oceanography or the presence of continents. The current processing system ignores these effects (using in-plane propagation for all acoustic paths) and has large error bars in azimuth for event association. In this work, a set of acoustic propagation codes are being used to integrate 3-D propagation into the automated event localization algorithm as well as into the IMS analyst work flow. A summary of the acoustic models as well as demonstrations of observed 3-D phenomenon for large underwater events will be presented as well as a programme plan to update the IMS processing approach.

## E-mail

Kevin.heaney@appliedoceansciences.com

### **Promotional text**

Three-dimensional acoustics in hydroacoustic event processing.

# **Oral preference format**

in-person

#### Primary author: HEANEY, Kevin (Applied Ocean Sciences)

**Co-authors:** COELHO, Emanuel (Applied Ocean Sciences); PRIOR, Mark (TNO); Mr OLIVEIRA, Tiago (CTBTO Preparatory Commission); Mr SARAGIOTIS, Christos (CTBTO Preparatory Commission); ZAMPOLLI, Mario (CTBTO Preparatory Commission); Mr HARALABUS, Georgios (CTBTO Preparatory Commission)

Presenter: HEANEY, Kevin (Applied Ocean Sciences)

Session Classification: Lightning talks: P1.3, P1.4, P5.2

**Track Classification:** Theme 1. The Earth as a Complex System: T1.3 The Oceans and their Properties