ID: Type: **Oral**

CTBTO hydroacoustic data to evaluate long-term trends in deep-ocean noise in the Southern Ocean

This paper describes a statistical method for performing long term trend analysis and uncertainty evaluation of the estimated trends from deep-ocean noise data. The measured data used originate several of the hydroacoustic monitoring stations of the CTBTO and span up to a maximum of 15 years. The analysis method uses a flexible discrete model that incorporates terms that capture seasonal variations in the data together with a moving-average statistical model to describe the serial correlation of residual deviations, with uncertainties validated using bootstrap resampling. The main features of the approach used include (a) using a model that includes terms to represent explicitly seasonal behaviour, (b) using daily aggregation intervals derived from 1 minute SPL averages, and (c) applying a non-parametric approach to validate the uncertainties of trend estimates that avoids the need to make an assumption about that distribution of those differences. The trend analysis is applied to time series representing monthly and daily aggregated statistical levels for five frequency bands to obtain estimates for the change in sound pressure level with associated coverage intervals. Statistically significant trends in SPL are observed for all percentiles in the frequency bands. Seasonal variation is also observed, with correlation with relevant climatic factors.

Primary author: ROBINSON, Stephen (National Physical laboratory)

Presenter: ROBINSON, Stephen (National Physical laboratory)

Track Classification: 2. Data analysis and signal processing methods for CTBT verification purposes