



ID: O1.3-513

Type: Oral

-term observations of a potential great whale call from the central Indian Ocean during 2002-2019

Thursday, 1 July 2021 17:04 (15 minutes)

This work presents observations of a potential great whale call at Diego Garcia (HA08N and HA08S). The whale calls which remain unidentified have only been referred to as the Diego Garcia Downsweep (DGD). The calls occur between 20-45 Hz, and constitute a set of tones similar to a comb, followed by a downsweep. The calls between 2002-2019 are used to present two analyses. The first shows that the DGD call-frequencies change across the years. The comb frequencies steadily increase, while that of the downsweep decrease but also branch into higher frequencies. The second set of results present angle and range estimates of the whale. For angle estimates this work uses a broadband beamformer which incoherently combines narrowband beamformer outputs across the multiple frequencies of the calls. For range, the work builds an Nx2-dimensional Parabolic Equation (PE) model to predict the received intensities across range. The model incorporates the local sound speed profiles, and the complicated bathymetry across a 1500 km area around HA08. The intensity predictions are compared against the received call levels to estimate ranges of the calling whales. Preliminary results show that the estimates pick out tracks of nearby whales, and some potentially distant calls.

Promotional text

Long-term recordings from the IMS stations at Diego Garcia suggest that the Indian Ocean abounds in marine mammal diversity, with several blue whale species. Recordings were used to study changing vocal behavior and migration paths of one potential whale species.

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Session Classification: T1.3 - The Oceans and their Properties

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