

International workshop. Cetacean echolocation and outer space neutrinos:
ethology and physics for an interdisciplinary approach to underwater
bioacoustics and astrophysical particles detection



Contribution ID: 20

Type: **Invited Lecture**

Looking for spaghetti in a haystack: Semiautomatic approaches to detecting marine mammals in highly variable noise environments

Saturday, 19 October 2013 15:20 (50 minutes)

The wide variety of sounds produced by marine mammals are for the most part well documented. While some of these sounds, such as fin whale moans and the clicks of harbour porpoise and beaked whales are highly stereotyped, others, such as humpback song and dolphin whistles are highly variable both at the individual and at the population level. Even the more stereotyped sounds can become highly variable at the receiving instrument due to changes in the emitting animals orientation relative to the receiver and changes in sound propagation conditions. As well as a highly variable sound source, detection systems also have to deal with variable background noise, with interference from other natural sources (e.g. other animals, wind and waves, natural seismic activity) as well as anthropogenic sources (e.g. vessel noise, sonars, piling, oil and gas exploration). While humans are generally excellent at differentiating signals of interest from noise, automatic detection is essential for the analysis of large continuous datasets. Developing automatic detectors for poorly defined signals in unknown noise is however a near impossible task. An effective solution is often semi-automatic detection in which automatic detectors reduce the amount of data that has to be viewed by a human to a manageable quantity. The level of automation that can be applied to a specific data set depends heavily on the type of signal, the types of noise encountered, and also the level of detail required in the information that is to be extracted from the data. In certain circumstances, detection can be close to 100% automatic, with the human doing little more than reject a small number of false alarms, in other circumstances, a high level of operator input is required.

Presenter: GILLESPIE, Doug (St. Andrews Univ., UK)

Session Classification: Information technology & infrastructures for acoustic data acquisition, archival and analysis