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Acoustics in water: synergies with marine biology

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The ANTARES project, in addition to optical detectors, includes an array of 36 hydrophones that was installed with the aim of acoustic neutrino detection. The acoustic data stream has been active since 2008 and is managed under AMADEUS. Coincidentally, ANTARES is installed in the Pelagos marine sanctuary, home to many marine mammals species, both whales and dolphins, all of which are acoustically active. The fact that ANTARES is cabled (providing real-time access to data) makes it a unique observation platform for the local marine fauna. The LAB has been analysing the acoustic data, relayed through AMADEUS, since 2010 with a focus especially on sperm whales and dolphins. Presented here are some of the signal processing techniques that have been used for the sperm whale detection and classification algorithms. In addition a study was done to relate background noise levels to animal presence. The ability to study trends in animal presence and a possible relationship with anthropogenic activities for such a long and continuous time frame is unique and is impossible as a purely biological initiative; the costs for installing such a platform just to measure sound levels and to monitor the environment are too high. Opening up platforms such as ANTARES, and for example Neptune from the ONC, to marine researchers will not only help to improve marine research but may also help to obtain funding by widening the scope of applications. In that sense, it would be advantageous to take into account design requirements of other fields when deploying new monitoring platforms (e.g. KM3). For example, for acoustics it would be preferred not to use hardware high-pass filters and to store or transfer the raw data.

Summary

Author: Dr VAN DER SCHAAR, Mike (Universitat Politècnica de Catalunya)

Presenter: Dr VAN DER SCHAAR, Mike (Universitat Politècnica de Catalunya)

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