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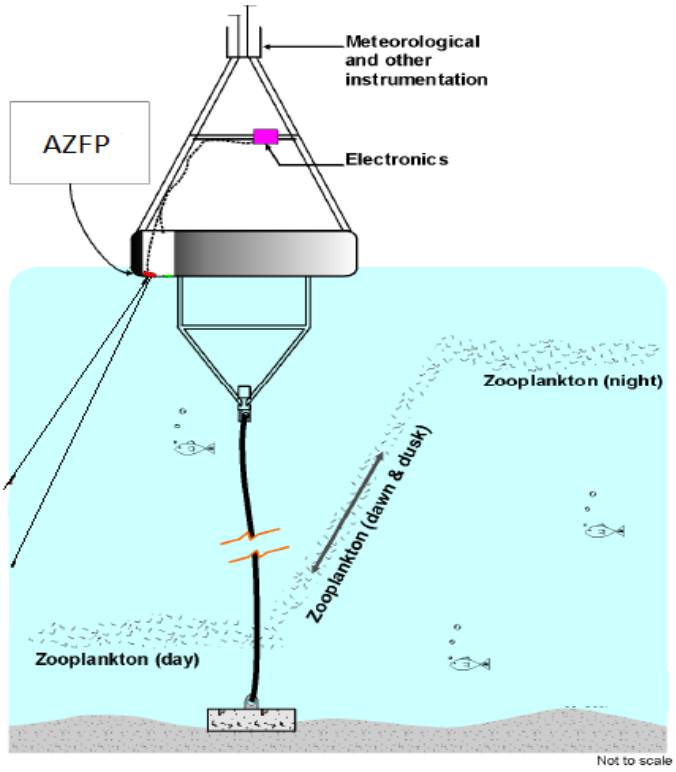
Downward-looking AZPF instrument for buoy mounting (concept)

1.0 General Description

Scientists are interested in mounting the single- and multiple- frequency versions of the AZFP instrument on small, medium and large ocean buoys in the downward looking mode for several purposes:



1- To leverage existing infrastructure put in place to monitor the environment through the adding additional technologies.
2- The buoy allows for simple real-time access to data.
3- Instrumentation can be serviced and raw data collected as part of regular maintenance programs already in place.

Instrumentation on the buoy is subject to terrible weather, vandalism, theft and damage from vessel collision. Biofouling is a bigger problem at the surface. Acoustic data from a moving platform such as this is not so "clean" as from a bottom mooring especially for smaller buoys and/or more dynamic seas.

Our standard configuration does not meet all the needs of this application and hence the need for a special version.

2.0 Transducer considerations

For the subject mooring configuration, conditions for biofouling can be quite favourable. Water temperature at the surface can be very high. Light levels are also very high. Consideration needs to be given to anti-biofouling features to help reduce maintenance.

For the transducer cable, we expect to use connector that can be submersed and fed through a passage from the bottom of the buoy as part of the installation process. To avoid interference with mooring lines in the field of view it may be necessary to mount the transducer at an angle to the axis of the buoy.

3.0 Tilt measurement

Tilt corrections are necessary to convert the acoustic range to water depth (both in the time domain). With the separate mounting of the transducer and electronics boards and with the placement of the tilt sensor with the electronics, the alignment of the electronics housing with respect to the transducer housing configuration will determine a tilt sensor off-set.

Installation directions will include instructions on how to align panel and the transducer.

4.0 Environmental

The instrument will be subjected to high and low temperatures, to shock and vibration with the tides, currents, waves and to occasional storms. As part of the system design, ASL expects to conduct long-term vibration testing of the final system using a shaker table to ensure long-term reliability. Extreme temperature testing in an environmental test chamber will also be conducted.

5.0 Power supply

Since buoys usually have tight power budgets, the low-power aspect of our instrument is a big asset. The instrument can be powered from 12Vdc (or other voltage with a dc-to-dc convertor option) the buoy's solar array and battery power supply.

6.0 Software and data output

Typically, there are some through-put constraints of the communication system. ASL has implemented a second set of averaging parameters (in time and in range) specifically for the real-time data output. This allows enough averaging or selective sending of data to manage the data volume. During the regular maintenance scheduled visit, it is possible to collect the full data set by replacing the flash card.

7.0 Additional consideration

ASL is committed to making the instrument work for the client. As such ASL is ready to work with clients to ensure that the instrument meets all requirements of this demanding application.