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Weather observations through oceanic acoustic noise recorded by gliders

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Offshore estimates of the meteorological parameters are unfortunately spurious when considering in-situ observtions only due to obvious observational limitations while their use would allow to calibrate satellite observations and to have better weather forecasts, if assimilated in numerical weather forecasting systems. The WOTAN (Weather Observations through Acoustic Noise) approach may be used to fill these gaps if coupled to the Global Ocean Observing Sytem which has now a global coverage thanks to many autonomous observing platforms. In this study we show first results from acoustic records collected by gliders deployed in the northwestern Mediterranean Sea in the framework of MOOSE. We show that using 3 descriptors at 5kHz, 8kHz, and 20kHz allows to extract the intensity of the wind and the precipitation when the glider is at depth. This approach based on the method presented by Barry & Nuysten (2004) is compared with meterological data from coastal weather stations and the offshore meteorological buoys from Meteo-France. We also show that there is a vane effect with the tail of the glider while at surface which allows to estimate the direction of the wind every so often. These observations coupled with the in-situ profiles on temperature and salinity profiles can allow to better study air-sea interactions.