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Quality control of long-term oxygen and related observations at the Koljoe Fjord Observatory, Sweden

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A cabled observatory was deployed at 40 m depth in the Koljoe Fjord, Swedish west-coast, in April 2011. One node of the observatory is equipped with around 30 sensors to monitor oxygen (with optodes), salinity, temperature and currents in the water column. This node has also been used for testing of new CO_2 optodes. The Observatory has a remote telemetry system implemented with on-line control, and measured values are available in real time (see http://mkononets.dyndns-home.com:8080/).

Located close to the Observatory is a sampling station for the Swedish national monitoring program run by SMHI (Swedish Meteorological and Hydrological Institute, http://www.smhi.se/oceanografi/oce_info_data/SODC/download_sv.htm). Every month samples are taken at several depths, and numerous water parameters are analyzed with traceable high accuracy and precision methods.

In this presentation quality control of oxygen and other data collected by this coastal observatory will be in focus. Even with the monthly reference data available, checking measured sensor values against the reference is challenging, especially for oxygen. There are several potential sources of errors like biofouling, tidal fluctuations that induce movements of pycno/oxycline and difficulties in taking uncontaminated samples at low oxygen conditions. Sensor data suggest that oxygen can occasionally vary with up to 70% of air saturation within a few hours at a single depth.

Influence of the factors affecting oxygen measurements will be illustrated. Points important for correctly checking oxygen data will be highlighted. Possible ways of improving quality control from continuous monitoring data will also be discussed.