**249 Results from the 1st ICOS OTC pCO2 instrument inter-comparison 2021**
*Plenary*

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Session B. Marine and aquatic carbon cycling : B.2 The value chain of (surface) ocean CO2 measurements

In summer 2021, with one year delay, the Ocean Thematic Centre (OTC) of the European research infrastructure “Integrated Carbon Observation System” organized an inter-comparison exercise for pCO2 instrumentation. The exercise focused on surface applications and took place at the Flanders Marine Institute’s (VLIZ) Marine Station Ostend in Ostend/Belgium. The goal was the rigorous assessment of instrument capabilities and documenting their measurement uncertainty. Following this exercise, we aim to improve the quality and aid the processing of ocean pCO2 data, enabling better estimates of ocean CO2 uptake and ocean acidification. Furthermore, the ongoing interaction between manufacturers and the extensive user group that this experiment enabled facilitates continuous instrument improvement.
During the 2 week exercise, we deployed 29 instruments of 18 different types in a temperature-controlled water tank containing ca. 5 m3 seawater. The water pCO2 was manipulated by changing the temperature or by adding chemicals (acid or base). This allowed us to compare the pCO2 measurements at different temperatures (10 – 30°C) and pCO2 levels (200 – 800 µatm). Here we present the results from the inter-comparison and provide suggestions for future experiments and sensor development.