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Carbon dioxide dynamics in coastal regions of Osaka Bay

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Measurement technique of CO_2 for coastal seas is developed and applied to elucidate CO_2 dynamics in the coastal regions, where the photosynthetic rate is far larger than that in the open sea and the short-term change is significant. Continuous measurements of salinity, pH and DO were conducted at three stations in Osaka Bay. The values of CO_2 related terms were calculated using a classical method that uses pH and total alkalinity. Dissolved inorganic carbon (DIC) and DO fluctuated with high correlation (R^2 = 0.97). This suggests that CO_2 system can be measured by this method in coastal regions. DO and pCO_2 (CO_2 partial pressure) records in the eastern Osaka Bay, where primary production is significant, indicated prominent diurnal variations which correspond to diurnal irradiation variations. In contrast, magnitudes of DO and pCO_2 variations were smaller in a well mixed reason in the western Osaka Bay.