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PE-23 Time series analysis of the chemical and oceanographic parameters of the seawater around coral reef ecosystems, Okinawa, Japan

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Fluctuations of pH, alkalinity, DO_2, and PCO_2 as well as sea level variations and water temperature at the coral reef flat of Sesoko-jima, Okinawa, Japan, have been studied based on 15 minute time-interval data collected for 6 months from May to October 2000 using multi-parameter sensor and water analysis.

Time series analysis of the data were used in calculating frequencies as well as the power spectra (18420 points), using Short-Time Fourier Transform (STFT) analysis by decomposing a time series into time-frequency space, and utilizing AutoSignal analysis software. The dominant modes of variability and how those modes varied in time were determined then correlated with the prevailed weather conditions.

Time series analysis of the data revealed that the chemical parameter variations might be mostly related to photon flux and sea level changes and could be closely affected by the prevailed weather conditions, water runoff as well as the coastal coral reef communities and their metabolic product effects.