

**Sea Surface fCO₂ measurements in the Tropical-Equatorial Pacific Ocean
obtained during the French JGOFS-FLUPAC cruise
on board L'Atalante, 26/09-30/10/94
(Chief Scientist, R. Le Borgne IRD/FRANCE)**

Prepared by N.Metzl

**Laboratoire de Biogéochimie et Chimie Marines (LBCM), UMR 7094
Institut Pierre Simon Laplace
Université P. et M. Curie - Case 134
4, place Jussieu - 75252 PARIS Cedex 5 - FRANCE
<http://www.lbcm.jussieu.fr/>**

Method

The sea surface fugacity of CO₂ (fCO₂) was measured onboard the research vessel L'Atalante (IFREMER) during the JGOFS/EPOPE/FLUPAC cruise by C.Brunet, A.Poisson and B.Schauer (LBCM, Paris). The fCO₂ measurements technique has been described in details in the cruise report (LeBorgne et al, 1996) and for other cruises conducted during years 1990-1995 in the Indian and Southern Ocean (Poisson *et al.*,1993; Metzl *et al.* 1995, 1998, 1999). This instrumentation was also used by our group during the international at-sea intercomparison of fCO₂ systems conducted in 1996 in the North-Atlantic (Kortzinger *et al.*, 2000).

In short, sea surface water is continuously equilibrated using a "thin film" type equilibrator thermostated with surface seawater. The CO₂ in the dried gas is measured with a non-dispersive infrared analyser (NDIR, Siemens Ultramat 5F). Standard gases for calibration (280, 350, 490 ppm) and atmospheric CO₂ are measured every 7 hours. To correct measurements to in situ data, we used polynomials given by Weiss and Price (1980) for vapour pressure and by Copin-Montégut (1988, 1989) for temperature. On average, the temperature in the thermostated equilibrium cell was 0.2°C warmer than SST during FLUPAC cruise. Based on different cruises analysis, the oceanic fCO₂ data are accurate to about ± 0.7 µatm. All parameters presented in this data-set correspond to the average of about 60 records obtained during 10 minutes.

The fCO₂ data obtained during FLUPAC cruise have been presented by Metzl et al. (1995, 1996) and Poisson et al. (1996), and have been included in synthesis studies of air-sea CO₂ fluxes at regional scale in the equatorial Pacific (Boutin et al., 1999; Feely et al., 2002), for

constructing global scale pCO₂ climatologies (Takahashi et al., 2002) and for comparing and/or validating global carbon ocean models (e.g. LeQuéré et al., 2000).

File description

The file **FLUCO2W.xls** contains all the results of sea surface fCO₂ measurements (and associated properties) made onboard during the cruise EPOPE/FLUPAC. The columns of the file include: Date (dd/mm/yy), time (hh:mn), Latitude (degre.degre), Longitude (degre.degre), atmospheric pressure (mb), sea surface water fCO₂ fugacity (µatm), temperature in the equilibrium cell (°C), sea surface temperature (°C), and sea surface salinity (PSU). The first date, first line of the data set, is 26/09/94 at 01:46.

This file is a companion file of the OLICO2W.xls which contains the measurements obtained during the french JGOFS EPOPE/OLIPAC cruise conducted after FLUPAC in November 1994 onboard L'Atalante.

For more information or if you have questions concerning these data, please contact N.Metzl (metzl@ccr.jussieu.fr)

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