Documentation of CTD Data from RV Meteor Cruise No. 31 Leg 3 (28.04.98)

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1. General

The Data on RV Meteor cruise No. 31 leg 3 were collected within the German JGOFS Programme. The cruise took place in the Arabian Sea from the 06.03.1995 until 22.03.1995, starting and finishing at Djibouti (Rep. Of Djibouti). Chief scientist was Prof. Dr. Christoph Hemleben from the University of Tübingen, Germany. This cruise was the first of the German part of JGOFS Arabian Sea Process Study. The CTD probe was a Neil Brown Instrument Systems Inc. MARK IV combined with a 12 Niskin bottle rosette sampler.

The Data were collected and calibrated by:

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2. Processing (F. Wehner)

Twenty CTD profiles have been taken on cruise Meteor 31 leg 3.
The probe was a CTD EG&G Mark V, equipped with pressure, temperature, conductivity and oxygen sensors and a backscattering fluorometer integrated into a 12*12L rosette sampler from General Oceanics.
For calibration of the CTD-instrument reversing thermometers were used and bottle samples were taken for salinity measurements with an Guidline Autosal bench salinometer. Oxygen was measured by Winkler titration.
The data have been processed with the AFRAID program. Spikes have been removed from all profiles before any calibration routines have been applied. The data have been monotonized on 1db steps and a polynom of the 7th degree has been applied on the data.
The conductivity cell of the CTD probe was calibrated at the lab at the IFM Kiel, using a 2-point calibration.
The dissolved oxygen was calculated with the following coefficients:

a(1)= 2.571
a(2)= 0.0001489
a(3)= -0.03834

a(4)= -0.02113
The results have been compared with values from literature.

3. Sensor description / technical details

(The following information were copied from the Neil Brown MARK IIIb conductivity, temperature, depth profiler underwater unit operation and maintentance manual 00101, Jan.1982.)

3.1 The Conductivity cell:

Electrical conductivity of sea water is obtained using a miniature, four electrode ceramic cell and highly precise and stable interface electronics. The conductivity cell is a NBIS Inc. #B10086 4 electrode cell 0.4cm x 0.4cm x 3cm long.
The conductivity sensor has got a range from 1 to 65 mmho with an accuracy of 0.005 mmho, a resolution of 0.001 mmho and a stability of 0.003 mmho/mo.

3.2 The Temperature sensor:

The Temperature is determined by electronically combining the outputs of a high speed (30 milliseconds) thermistor and a platinum resistance thermometer. This composite output has the excellent long term stability and linearity characteristics of platinum probes and rapid thermal response found with thermistors. The sensors were a Platinum Thermometer Rosemount Model 171 BJ 200 Ω @ 20℃ (185.3 Ω @ 0℃) and a Thermistor Fenwal #GC32SM2 2000Ω @ 25℃.
The sensor range starts at –32℃ up to +32℃ with an accu racy of +/- 0.005℃ (in the range from –3 to +32℃) and a resolution of 0.00 05℃ and a stability of 0.001℃/mo.

3.3 The Pressure sensor:

A high performance, strain gage pressure transducer and associated electronics were used to determine pressure. The pressure sensor was a model from Paine, Model type 211-35-440; 350Ω bonded strain gage bridge, tube type. The instrument specifications are as follows:
in the range from 0-320db with an accuracy of 0.5db and a resolution of 0.005db
in the range from 0-650db with an accuracy of 1.0db and a resolution of 0.01db
in the range from 0-1600db with an accuracy of 1.65db and a resolution of 0.025db
in the range from 0-3200db with an accuracy of 3.2db and a resolution of 0.05db
in the range from 0-6500db with an accuracy of 6.5db and a resolution of 0.1db

3.4 The fluorescense sensor:

The fluorescense sensor from Dr. Haardt has got a linear characteristic 0-100 ug/l corresponding to 0.015 - 10 V. Resolution 0.05 ug/l. Spectral range of excitation and detection 360nm to 800nm. The accuracy of the sensor is +/- 0.005.