

CRUISE REPORT

Townsend Cromwell TC-94-07

15 August to 8 September 1994

Summary.

The objective of the cruise was to study the Equatorial Current System in the Central Equatorial Pacific. Initially, synchronous sampling with the Shuttle Imaging Radar at 140 W was planned, but after the failure of one of the shuttle engines delayed the shuttle launch to 2 October, and hurricane John made passage to 140W unsafe, the sampling was relocated to 155 W.

The ship transited from Honolulu to 155W 7N, repeated six time a hydrographic section along the 155W meridian down to 2N (to the Equator for the first and last sections), then transited back to Honolulu. A stop over was schedule at Christmas Island during the fifth leg to pickup gear left by atmospheric scientists.

Sixty five hydrographic stations yielding of profiles of temperature, salinity, dissolved oxygen, phytoplankton fluorescence and water transparency down to 280 m were performed. Acoustic Doppler currents profiles were collected continuously. Additional measurements were obtained using an array of ten mixed-layer drifters spaced every degree in latitude along 155W, real-time satellite infrared images, and air-sea interactions sensors.

The attached figures illustrate the most salient results of the cruise.

Scientific personnel.

1. Pierre Flament, Assistant Professor, Chief Scientist
2. June Firing, Junior Researcher
3. Sean Kennan, Graduate Assistant
4. Michael Sawyer, Graduate Assistant
5. Hans Ramm, Graduate Assistant
6. Christina Munch, Graduate Assistant
7. Deborah Koh, Graduate Assistant
8. Jiyu Yu, Graduate Assistant

Submitted by: P. Flament, Chief Scientist

Figures

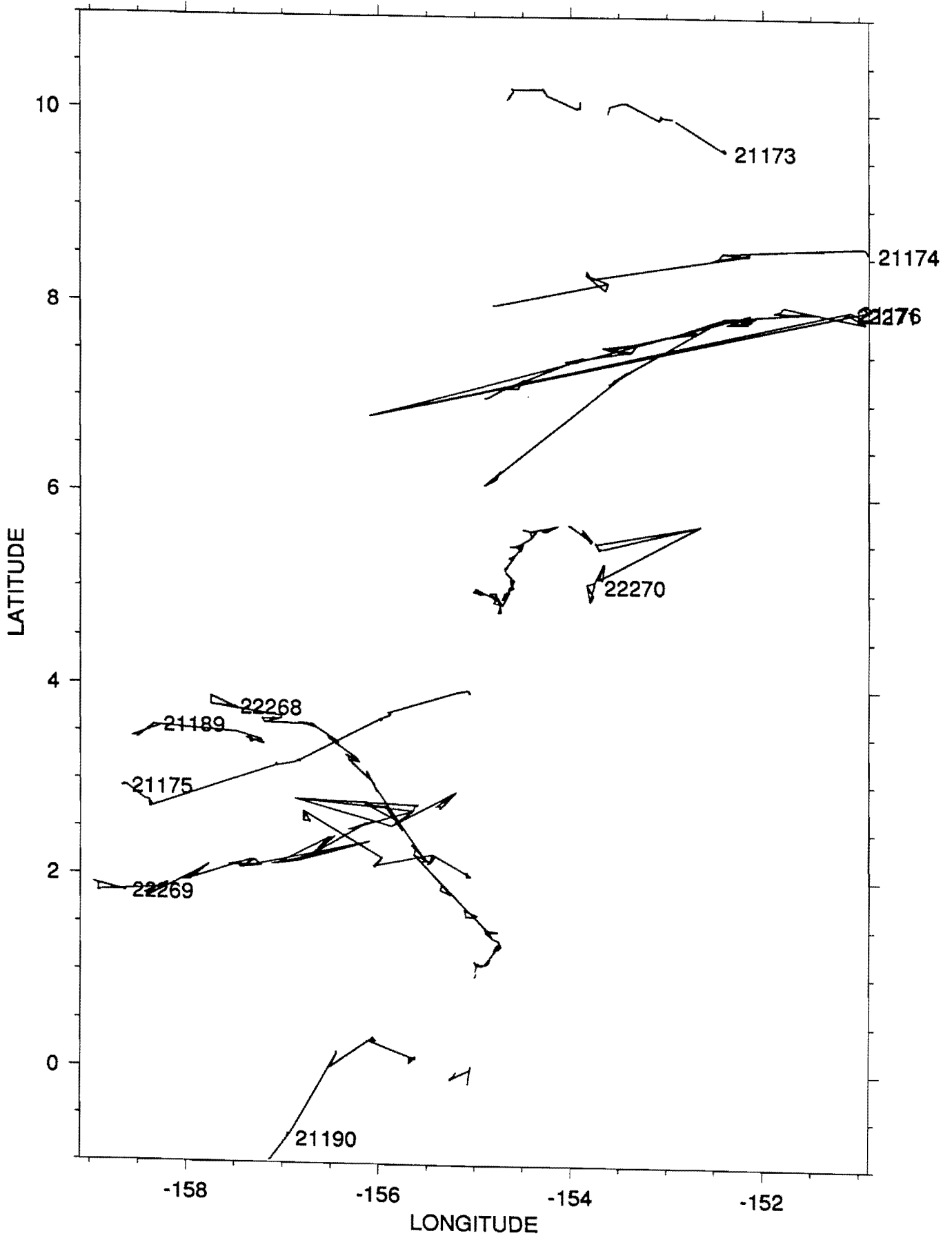
Fig. 1. Plot of the tracks of the drifters. Note the North Equatorial Counter Current (NECC) north of 5 N and the South Equatorial Current (SEC) to the south (M. Sawyer).

Fig. 2. Dynamic height of the surface referenced to 250 dbar from the CTD stations during the first southward section. The positive slope between 2.5 N and 5 N is the signature of the SEC, the negative slope north of 5 N is the NECC. Variations closer to the Equator may be noise, or may reflect the surfacing of the undercurrent observed at about 1.5 N (D. Koh).

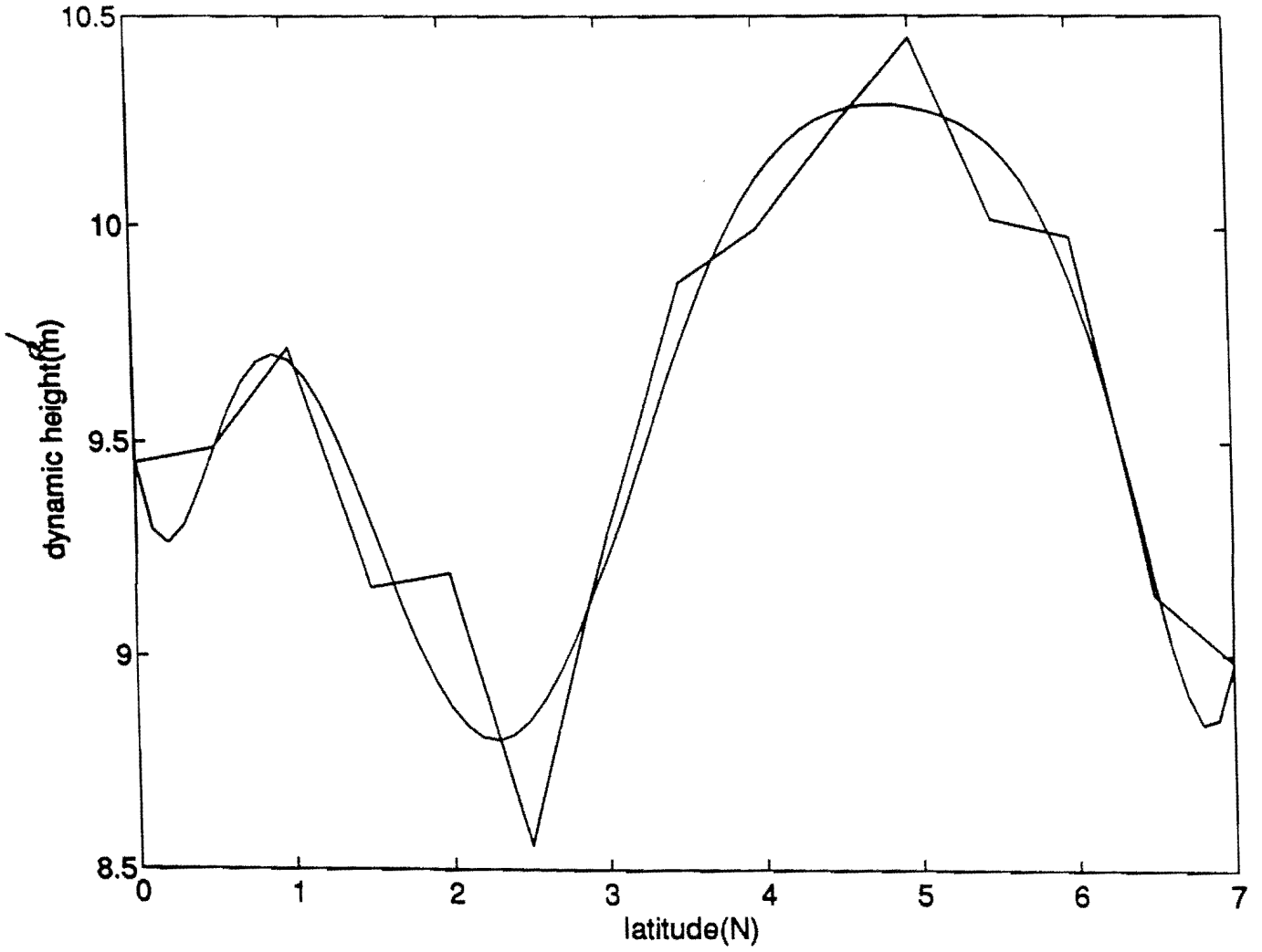
Fig. 3. Surface currents from the ADCP for each of the six meridional legs. Note the significant time variability of the currents (J. Firing).

Fig. 4. Zonal (U) and meridional (V) current sections from the ADCP during the first and last leg. Note the undercurrent surfacing at 1.5 N in the first leg (U), and the strong change of the V field (J. Firing).

DRIFTER TRACKS

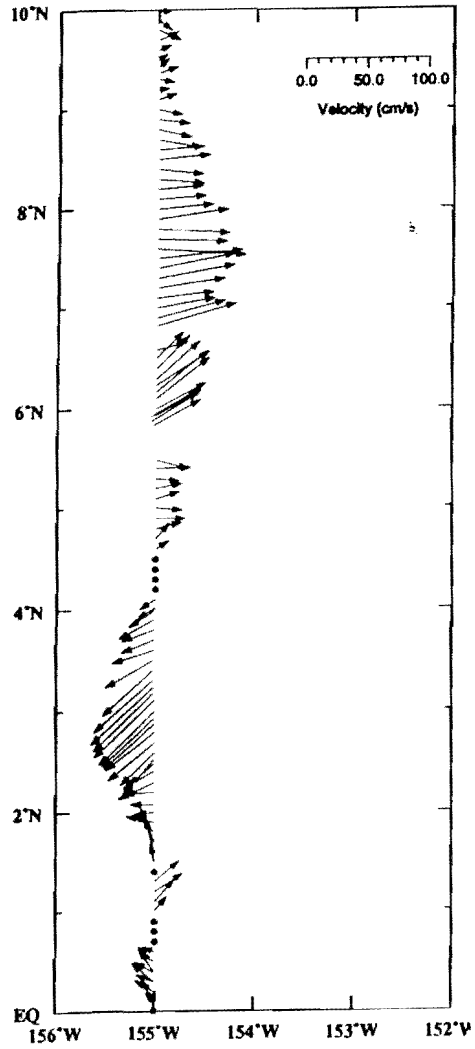


8th degree polynomial fitted to calculated dynamic height for sta001-015



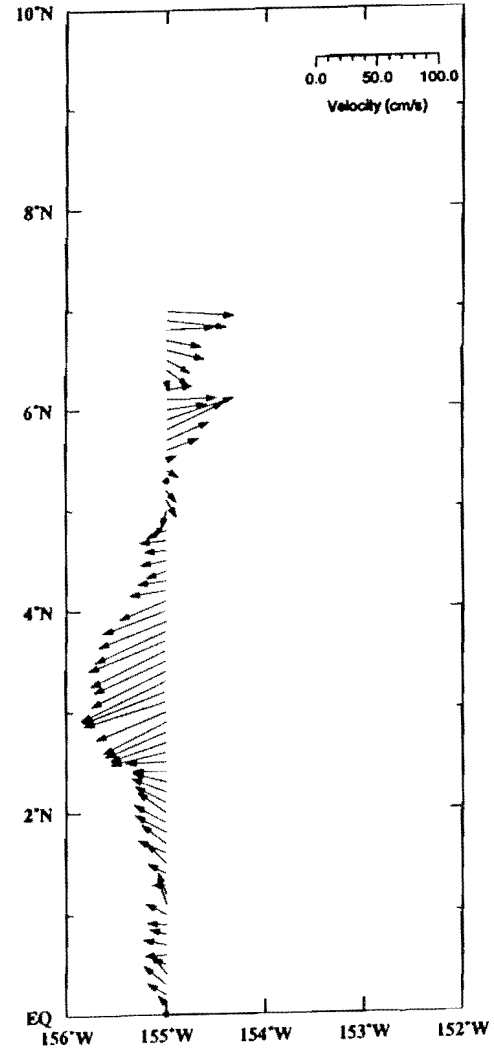
TC9407

August 20 to 23, 1994
Layer: 21m to 25m



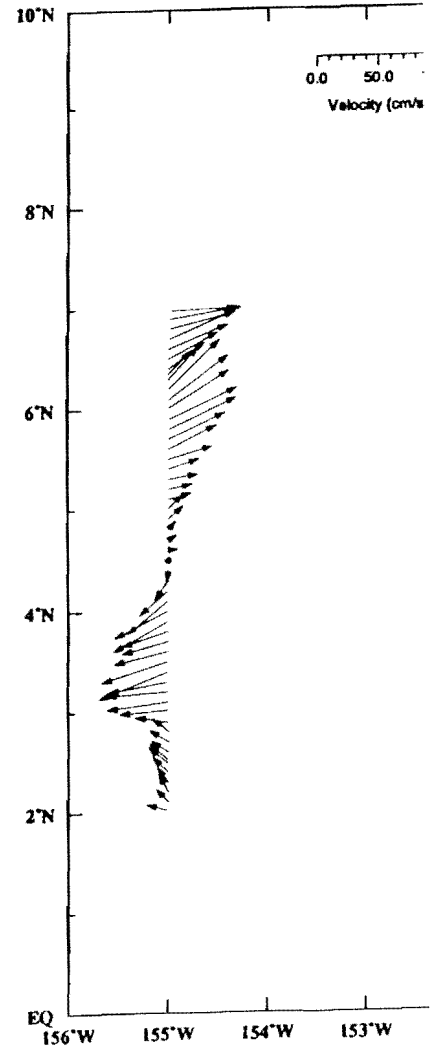
TC9407

August 23 to 25, 1994
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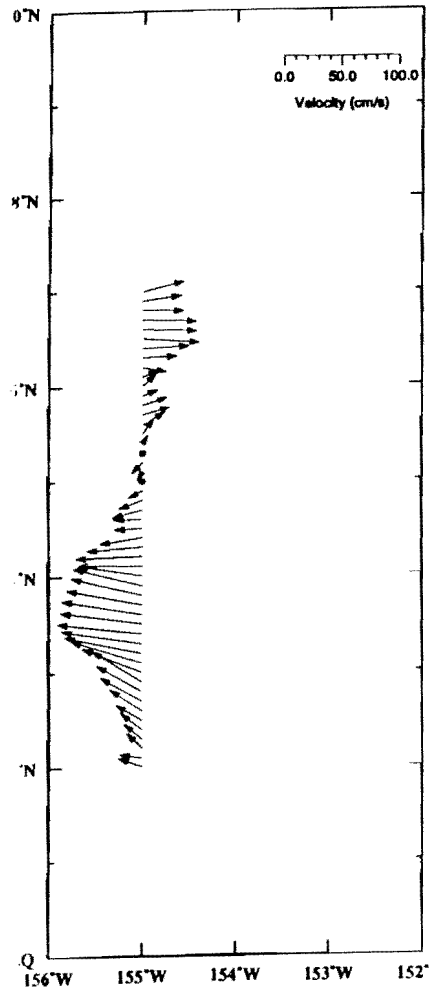
TC9407

Leg#3: 8/25-8/27, 1994
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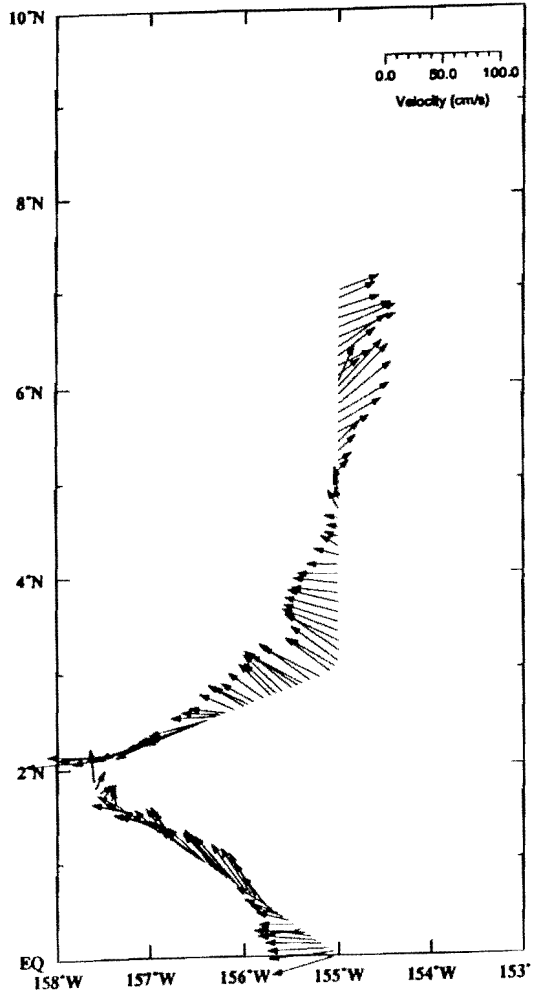
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Leg#4: 8/27-8/28, 1994
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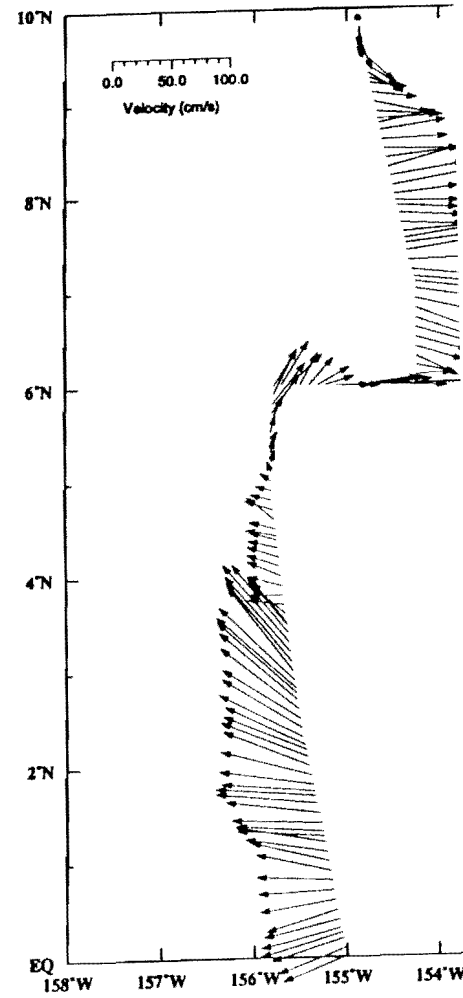
TC9407 ^{9/2}

Leg#5: 8/28-8/31, 1994
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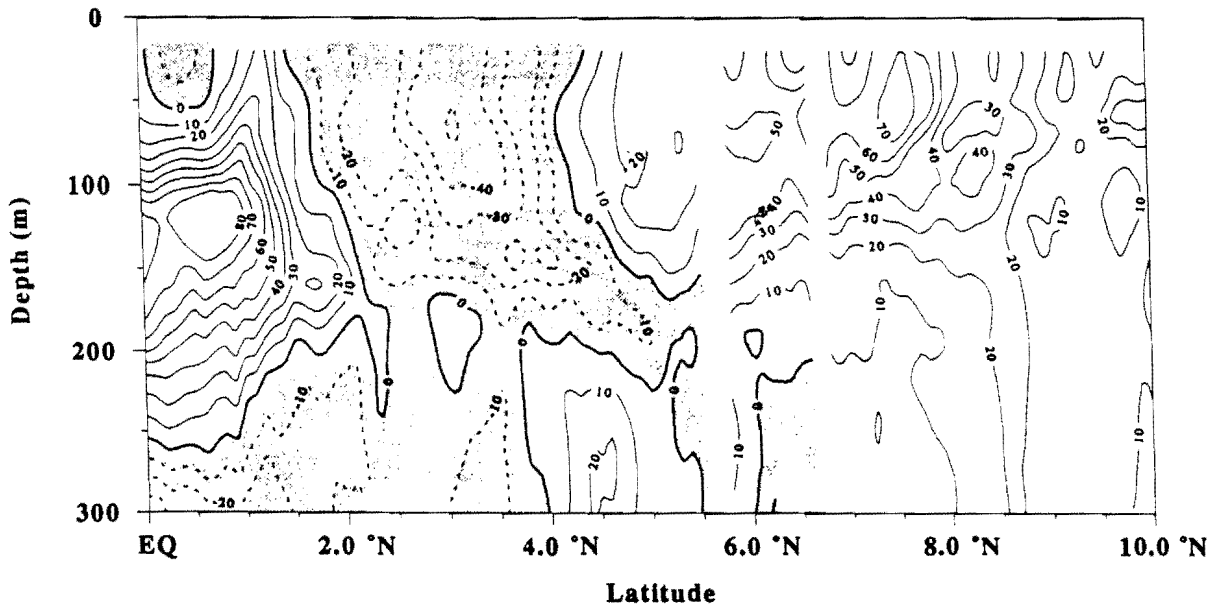


TC9407

Leg#6: 8/2-8/5, 1994
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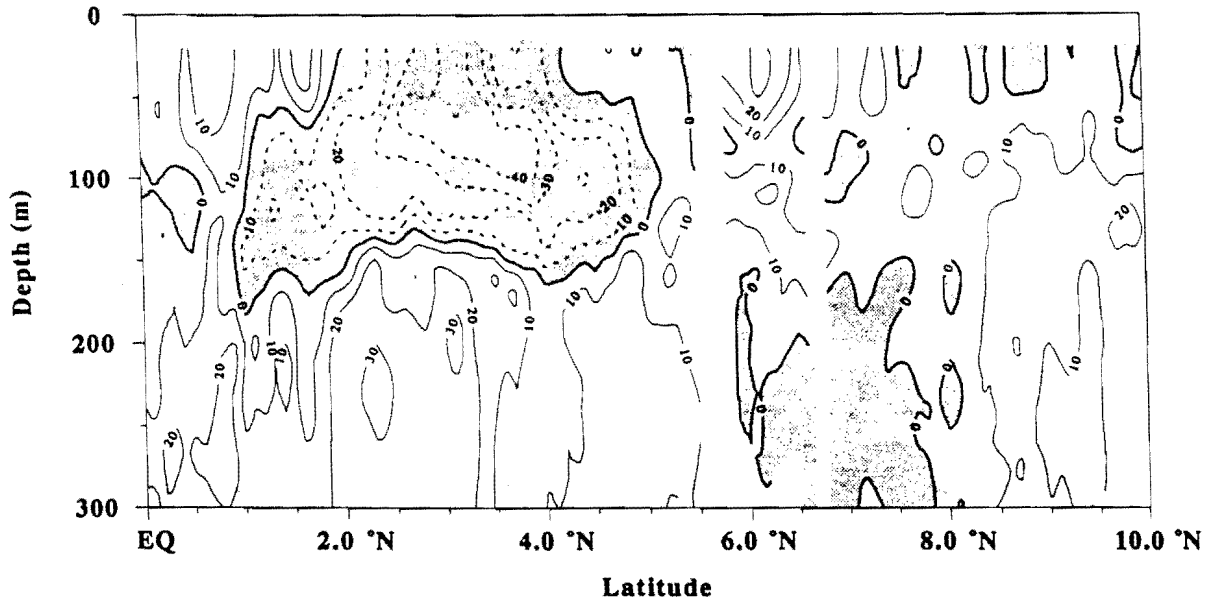


TC9407 Leg#1 8/20-8/23, 1994: U (cm/s)

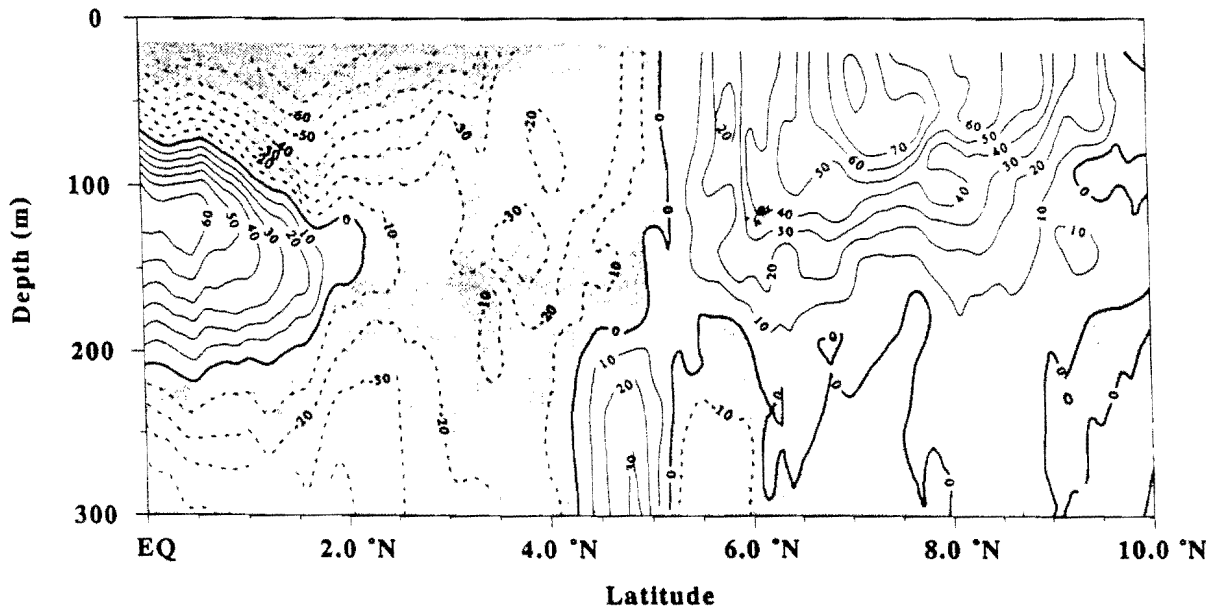


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TC9407 Leg#1 8/20-8/23, 1994: V (cm/s)



TC9407 Leg#6 9/2-9/5, 1994: U (cm/s)



cre 1: 6-Sep-94

TC9407 Leg#6 9/2-9/5, 1994: V (cm/s)

