

MEASUREMENT OF INTERNAL WAVES IN THE CHANNEL OF SICILY

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Internal wave activity has been measured during October 1985 in the Channel of Sicily in a water depth of 97 meters. An AANDERAA thermistor chain was fixed to the N/P Agip platform at 37° 31' 11" N, 11° 53' 33" E; ten thermistors were placed at nominal depths of 3, 13, 23, 33, 43, 53, 63, 73, 83 and 91 meters below the surface. Data were recorded every two minutes to resolve the detailed structure of the internal wave field.

During the same period the vessel N/O Bannock of the Italian National Research Council was deployed in the Sicily Channel to conduct the JANUS experiment as a part of the POEM project;¹ CTD casts were obtained in the vicinity of the platform, indicating a well defined stratification with a thermocline at a depth of about 40 meters.

Time series of temperatures from the moored chain show large amplitude internal wave fronts occurring at 24 hour intervals. Spectral analysis of the data reveals that the 24 hour tidal component dominates the motion, while the 12 hour component is much less pronounced. We suspect that the internal fronts are generated by the tidal flow, however the exact mechanism is unclear.

The dominant vertical linear eigenmodes of the data and their energy content have also been determined. Power spectral analysis of the data shows an f^{-2} spectrum at high frequency. Correlations among the signals at various depths have also been computed.

The large amplitudes of the measured internal wave field suggest the possibility of nonlinear effects. We plan to study this and other similar data using nonlinear models based on the Korteweg-deVries equation² and its generalizations.^{3,4} The methods are a kind of nonlinear spectral analysis previously applied in other situations.^{5,6}

REFERENCES

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CURRENT METER OBSERVATIONS IN THE STRAIT OF OTRANTO DURING POEM-0-85

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Two current meter moorings were maintained in the Strait of Otranto from October 20 to November 2, 1985, during the POEM-0-85 cruise. A preliminary analysis of the data has shown that the Italian continental shelf was the location of a quasi-permanent southward flow, with average velocities of 9.5 and 5.8 cm/sec at 58 m depth and near the bottom respectively.

In the central part of the Strait a two-layer circulation was observed. In the surface layer the net drift was to the north with an average velocity of 5.2 cm/sec, whilst in the deeper layers (573 and 874 m. depth) the flow was southeastward with average velocities of 1.4 and 7.1 cm/sec respectively.

Current intensification and inertial oscillations were experienced during the passage of meteorological perturbations. Short periods of flow reversal were also observed. They were caused by strong winds and/or wind-induced set-ups of Adriatic mean sea level.