

NEAR SURFACE CURRENT DETERMINED FROM INPE'S SATELLITE-TRACKED
BUOY, DURING 6-26 NOVEMBER, 1985

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ABSTRACT

A field experiment was made to test INPE's drifting, oceanographic buoy during 6-26 November, 1985. Buoy measurements obtained during 10-20 November were made from the Brazilian hydrographic ship Alte. Saldanha, near $24^{\circ}8'S$, $45^{\circ}13'W$. Within the buoy, a UHF transmitter compatible with System ARGOS, transmitted sensor data via an omnidirectional antenna within the buoy. The System ARGOS aboard polar orbiting satellites e.g., NOAA-7 and NOAA-9, received, recorded and retransmitted the buoy's signals, as the satellites passed over the local horizon of the buoy. Geographic fixes are determined from the doppler frequency of the buoy's transmissions, in combination with the known orbital characteristics of the satellite receiving the signals. The first part of the experiment obtained positional data when the buoy was stationary on land; the second part obtained positional data while the buoy was adrift at sea. There were five times when the buoy was stationary. Positional accuracy of the buoy was estimated by determining positional differences with respect to the five mean positions, and then combining these differences to make an overall estimate of the positional error (1σ). Based on 46 ARGOS positions, the latitude was determined to be known to within $\pm 0.003^{\circ}$ ($\pm 285m$) and the longitude to within $\pm 0.008^{\circ}$ ($\pm 810m$). During the drifting buoy part of the experiment, the positions of the buoy were determined by ship's radar and by System ARGOS. The mean velocity of the buoy drift was $13.0cm\ s^{-1}$ toward 273° from the radar measurements and $14.1cm\ s^{-1}$ toward 274° based on ARGOS data, and are not considered statistically different. This experiment suggests that INPE's drifting buoy is capable of obtaining useful measurements of near surface currents.