

SEA SURFACE TEMPERATURES IN THE VICINITY OF A COASTAL POWER PLANT
DERIVED FROM AIRBORNE PRT-5 RADIOMETER

Héctor M. Inostroza V.
Merritt R. Stevenson
Instituto de Pesquisas Espaciais-INPE
12225-C.P. 515 - São José dos Campos, SP - Brasil
Yoshimine Ikeda
Instituto Oceanográfico da Universidade de São Paulo-IOUSP
05508-C.P. 9075 - São Paulo, SP - Brasil

ABSTRACT

The fourth of 5 field studies, of the effect of heated discharge water on the adjacent coastal bays, was made during 16-18 May, 1984. The ANGRA-04 Mission consisted of collecting sea surface temperature (SST) data from a small high-speed boat, while INPE's research aircraft flew a set of 13 flightlines at 917m altitude over the adjacent bays, where the water to cool the power plant is obtained and where the heated water is discharged. In this report, SST charts, produced from the in situ measurements, are compared with the uncorrected SST charts based on the airborne PRT-5 (precision radiation thermometer) radiometer data. The in situ measurements in Piraquara de Fora bay showed a maximum temperature of 31.6⁰C near the discharge point and a minimum of 24.1⁰C 3km from it. In the bay of Piraquara de Fora the maximum radiometric uncorrected temperature was 24.5⁰C at a distance of 700m from the discharge point and a minimum of 23.5⁰C 3km from it. The in situ temperatures were paired with the uncorrected PRT-5 temperatures and the resulting regression equation was: $T_c = 0.8426 T_{PRT} + 5.94$, where T_c is the corrected temperature and T_{PRT} is the uncorrected PRT-5 temperature. This correction is used to account for the atmospheric effects on the sea surface temperature. Finally, the total precipitable water in the atmospheric column was calculated by using the radiosonde data of Galeão Airport, and assuming that these data are not significantly different from the atmospheric water vapor above the Angra dos Reis power plant.