Parameterization of the Marine Boundary Layer for Use in Circulation Modellings and Duct Propagation in the Indian Ocean

P.K. Pasricha

National Physical Laboratory, New Delhi 110 012

ABSTRACT

In >tosiiiIIKavLviiuulH-HisUVHUU-tira,iltiv,ihi-M.jisiiIjii-siiliji-siilijii-siiliji-siilijii-siilijii-siilijii-siilijii-siilijii-siilijii-siilijisiiliji-siiliji-siiliji-siiliji-siiliji-siiliji-siiliji-siiliji-s

The meteorological observations of temperature, humidity (both at 1 5 m and 13m),wind speed and diii'itiitin (at i "» in) and atiiiosphetic pressure wete made by the autbui dinning the second Indian Suentilu I xyuulitimi tit the Atitaulaa in 1960-HI, using an automatic weather station.

INTRODUCTION

The boundary layer in the first metres above the sea surface is of crucial importance in the airsea transfer of momentum and for the exchange of heat and water vapour between ocean and atmosphere. It is here that the basic processes occur which ultimately influence the general circulation. Under certain conditions, this interfacial layer may lead to so-called an 'evaporation duct' channel for over-the-horizon microwave propagation.

This report presents maritime meteorological observations in the boundary layer, made in a cruise to the Antarctica, and their parameterization in the form of latitudinal profiles. The resulting modelled profiles of temperature and humidity are compared with the ones adopted in certain circulation models.

Work is in progress to calculate (i) thickness of evaporation duct over sea and (ii) turbulence structure parameter along the path of the cruise.

OBSERVATIONS

The meteorological observations of temperature (at 2 m and 13 m), humidity and wind speed (both at 13 m) and atmospheric pressure were made by the author during the cruise of the Second Indian Scientific Expedition to the Antarctica in 1982-83. The observations were made abroad the ship-of-opportunity, *Polar Circle*. The observations span the latitudinal range of 15 N to 70 °S.

RESULTS

The latitudinal distributions of temperature, humidity and pressure were obtained both for the upleg and downleg journeys in December, 1982 and March, 1983 respectively (Fig. 1, 2, 3). The mean profiles may rightly describe the northern winter conditions.

Parameterization of the Marine Bouandary

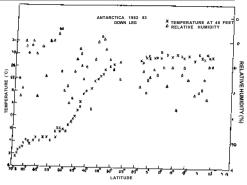


Fig. 1 Temperature and relative humidity variation during upleg

