

MARS CLIMATE ORBITER'S INVESTIGATION OF THE ATMOSPHERE AND POLAR CAPS. D. McCleese, V. Moroz, T. Schofield, F. Taylor and R. Zurek.

The Mars Climate Orbiter (MCO) is now on its way to Mars. It carries an atmospheric sounder whose observations will provide a continuous, global data set on weather and climate for a full Martian year. This paper describes the observation strategy and anticipated results from the Pressure Modulator Infrared Radiometer (PMIRR).

PMIRR will measure vertical profiles of atmospheric infrared radiance in the 7 to 50 micron wavelength region extending from the surface of Mars to 80-km altitude. The observations have a vertical resolution of 5 km, or one-half the atmospheric scale height. From these radiance profiles we will retrieve profiles of atmospheric temperature, pressure, and the amounts of dust, condensates and

water vapor. In addition, PMIRR will measure the radiative balance of the polar regions of Mars in an effort to better understand the short-term climate variability of the planet. The information obtained with PMIRR on MCO will be complementary to data obtained by the Thermal Emission Spectrometer (TES) and Radio Science (RS) experiments on the Mars Global Surveyor.

A major emphasis of our research will be the assimilation of PMIRR data into numerical models of the Martian atmosphere. Assimilation schemes, of which several are currently in development, will permit the extension of measurements to spatial and temporal scales and to phenomena (e.g. winds) not observed directly by PMIRR.