

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)

Reference Atmosphere of Venus and Mars (VIRA and MIRA) (C4.3)

SEASONAL AND SOLAR CYCLE VARIATION OF THE MARTIAN IONOSPHERE FROM NINE YEARS OF MARSIS ACTIVE SOUNDING

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This past June, we celebrated nine years of continuous operation by MARSIS, the radar sounder on the Mars Express spacecraft, in orbit around Mars since Christmas of 2003. The copious data from this instrument in its Active Ionospheric Sounding mode has been used in numerous scientific endeavors to generate empirical models of the Martian ionosphere. The full ionospheric profiles gleaned from analysis of these data are ideal for this kind of effort. Out of more than 170,000 traces collected, we have selected only about 10%, deemed to be of the best quality, and that can be fit to a Chapman layer function. We now have nine years, or 4-3/4 Mars years, worth of ionospheric traces. In addition to sampling nearly five years of seasonal variation, these nine years of data also represent 80% of a normal solar cycle. Therefore, in this work we shall analyze ionospheric traces with the objective of determining variation of atmospheric and ionospheric parameters such as the neutral atmospheric scale height, ionospheric peak altitude, and ionospheric peak density as they vary with the solar cycle and the change in season.