

EFFECT OF SOLAR ACTIVITY IN TOPSIDE IONOSPHERE/ATMOSPHERE OF MARS: MARINER 9, VIKING 1 AND 2 AND MARS GLOBAL SURVEYOR OBSERVATIONS. T. K. Breus¹, D. H. Crider², A. M. Krymskii³, N. F. Ness⁴ and D. Hinson⁵, ¹Space Research Institute (IKI), Moscow, Russia, ²The Catholic University of America, Washington, DC, USA, ³Rostov State University, Rostov-on-Don, Russia, ⁴Bartol Research Institute, University of Delaware, Newark, DE, USA, ⁵Center for Radar Astronomy, Stanford University, Stanford, CA, USA.

Introduction: The peak electron density in the ionosphere of Mars and the neutral atmosphere scale-height are proportional to the solar radiation flux. The data of the radio occultation experiments onboard Mariner 9, Viking 1 and 2 have already been analyzed to derive the relationship between the neutral atmosphere scale-height and F10.7 flux which was used as a proxy of the solar UV radiation. The data points from Mariner 9, Viking 1 and 2 missions are scattered from -40° to $+38^{\circ}$ in latitude and rather non-uniformly distributed in longitude. The experiment with the Mars Global Surveyor (MGS) Accelerometer has revealed significant diurnal variations and latitudinal and longitudinal variations in the neutral atmosphere density and scale-height. The effect of the solar radiation can be more confidently established if the effects of diurnal, latitudinal and longitudinal variations are minimized. The 523 electron density profiles derived from the data of the MGS Radio Science experiment, which were collected during the mapping phase of the mission, are located in the narrow latitude interval from $+67^{\circ}$ to $+77^{\circ}$. These profiles were also obtained within a narrow interval of local time and are practically uniformly distributed in longitude. The peak electron density and the effective scale-height of the neutral atmosphere density in the vicinity of the ionization peak have been derived for each of the profiles studied. The daily and running 81-day averages of advanced E10.7 index, which are derived from the solar radiation fluxes measured near the Earth and then re-calculated accounting for the position of Mars and the Earth, have been used as a proxy of the EUV radiation flux at Mars. The daily averages of the adjusted peak electron density and effective scale-height have been compared with the daily and running 81-day averages of E10.7 index. The effects of the solar activity derived from the MGS data are compared with the effects found in the Mariner 9, Viking 1 and 2 data.