



Global variations in topside ionospheric electron-density profiles over two solar cycles

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The mid-latitude transition height (where the O^+ and H^+ number densities are equal) is of importance because it is where the topside altitude distribution of the dominant ions transitions from the ionospheric F region into the plasmasphere which is considered the inner region of the magnetosphere. The O^+/H^+ transition height can be determined by fitting ionospheric-topside-sounder-derived electron-density (N_e) profiles to analytical O^+ and H^+ functions. We used $\sim 160,000$ separate N_e profiles from the height of the ionospheric N_e maximum up to an altitude of $\sim 3,000$ km deduced from Alouette and ISIS (International Satellites for Ionospheric Studies) topside-sounder data. These data, available over two decades starting from 1962, have been used to investigate variations in the topside N_e profiles to diurnal and seasonal changes as well as changes in solar-activity and geomagnetic activity.