

Field-Aligned Current Intensity and Ionospheric Conductivity: Statistical Study with DMSP-F7

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In the high-latitude region of the Earth we observe large scale Field-Aligned Currents (FACs). FACs are classified into three systems, that is, region 2 (R2), region 1 (R1), and region 0 (R0) systems from equatorward to poleward. Fujii and Iijima (1987) showed that the intensities of R1 and R2 have different patterns of correlation with the ionospheric conductivity in 4-10 and 14-20 MLTs under geomagnetically quiet conditions. They interpreted this result of theirs with two different source types, current and voltage sources: They concluded R1 is driven by a voltage source and R2 is driven by a combination of voltage and current sources. In this study we have used the magnetic data from the Defense Meteorological Satellite Program-F7(DMSP-F7), and expanded the study of Fujii and Iijima (1987) to other MLTs (mainly midday region) and R0 as well. Our results indicate that R1 is driven by more voltage-like source than R2 in the midday region, and that R0 is driven by a voltage-like source.