# STATISTICAL ANALYSIS OF INFLUENCE OF THE SOLAR-WIND PRESSURE ENHANCEMENT ON THE REGION-2 FIELD-ALIGNED CURRENTS

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The intensity of the Region-2 (R2) field-aligned currents is basically determined by the vector product between the magnetic-pressure gradient and the thermal-pressure gradient in the magnetosphere. Thus, the distributions of the magnetic pressure and the thermal pressure are both important in the generation of the R2 currents. Past spacecraft observations have suggested that the spatial distribution of the magnetic pressure in the magnetosphere varies with the solar-wind dynamic pressure; that is, the day-night asymmetry in the magnetic pressure in the magnetosphere is accentuated under high solar-wind dynamic pressure. The large day-night asymmetry in the magnetic pressure is favorable for the generation of the R2 currents. According to this argument, we can hypothesize that the intensity of the R2 currents are controlled by the solar-wind dynamic pressure. We compared the R2 current intensity at the altitude of the ionosphere, as derived using magnetic-field data from DMSP-F13, with the solar-wind dynamic pressure derived from OMNI2 hourly data. The result shows that the R2 current intensity depends on the solar-wind dynamic pressure during storm times. This finding suggests that the coupling between ionosphere and magnetosphere could be modulated by the solar-wind dynamic pressure during storm times. On the other hand, a correlation between the R2 currents and the solar-wind dynamic pressure is weak during non-storm times. The weak correlation during non-storm times suggests that the plasma pressure in the ring-current region is also essential for the effect of the solar-wind dynamic pressure on the R2 currents.

Region-2 current, solar-wind dynamic pressure, magnetic storm

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