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Mapping of the polar Jupiter's ionosphere to the equatorial magnetodisk in the Jupiter outer magnetosphere

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The field-alinged mapping of the Jovian polar ionosphere to the outer and middle equatorial magnetosphere region is one of most important problem of the magnetosphere – outer atmosphere interaction. Momentum and energy are exchanged between the ionospheres and magnetospheres of magnetized planets via the magnetic field that links them, thus setting up largescale current systems that flow between these regions. For the giant planet Jupiter, one of most important process is the current system generation associated with planetary angular momentum is transferred to the radially diffusing magnetospheric plasma produced from internal sources such as moon surfaces and atmospheres, to maintain partial corotation of the plasma with the planet. As it have been pointed out by Cowley et al., 2005 the total power dissipated from planetary rotation to upper atmospheric heating via the current system is several hundred TW per hemisphere. This compares with a globally averaged solar EUV input to the upper atmosphere of about 1 TW. These powers provide an important contribution to resolving the issue of the unexpectedly high temperatures found in the Jovian thermosphere. To understand how this power can be globally redistributed from the polar region where it is deposited we must have a correct model by magnetic field-aligned mapping of the ionosphere to the magnetosphere. The correct model of the magnetic field-aligned mapping of the ionosphere to the magnetosphere and vice versa have been presented. This model included both the field-aligned current and the main magnetospheric global current systems (the planetary dipole, the magnetopause current, the tail current, and the equatorial magnetodisk current).