

The Dayside Superfountain Effect: Interplanetary-Ionospheric Coupling

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Prompt penetration of interplanetary electric fields to the dayside equator has several important ionospheric effects. The equatorial ionosphere is uplifted to altitudes above the heights of polar orbiting satellites. The uplift leaves the lower altitudes devoid of plasma. Solar photoionization causes the production of a new ionosphere with the consequences of major total electron content (TEC)enhancements. Transport of uplifted equatorial plasma to middle latitudes is driven by the "dayside superfountain" effect. The above processes can lead to TEC enhancements greater than 300 percent. The large prompt penetration eastward electric field and its dayside superfountain effect can extend well into the post-sunset hours. The focus of the present talk will be to use ground magnetometer, ionosonde, ground and satellite GPS receiver data and theoretical modeling to answer some of the following questions. How much of the dayside ionosphere is lifted up during these events? How does the height-dependent ionospheric conductivity control the interplanetary electric field penetration? What are the ionospheric and atmospheric consequences of this phenomenon?