



Global observations from Swarm for ionospheric studies

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After more than 4 years in orbit, the Swarm constellation mission has collected global measurements of the geomagnetic field as well as the ionospheric plasma environment with a reasonable coverage in season and local time. The Swarm mission started around the maximum of the solar cycle 24 and has collected data during its declining phase. These data, sometimes combined with data from earlier or contemporary LEO satellites, have enabled climatological studies of ionospheric currents and plasma structures. For examples, the longitudinal variability of atmospheric wave structures in the equatorial electrojet and the seasonal dependence of the Poynting flux associated with low latitude plasma depletions have been studied. Furthermore, evidence was found for a plasma depletion threshold at which severe disturbances of navigational signals occur. In this review, we will present a number of novel studies and discuss open questions that have been raised from these observations.