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Ionospheric Diurnal Double Peak Structures

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The study of ionospheric disturbances and irregularities is beneficial to both the scientific advancement of knowledge as well as the practical applicability to high frequency (HF) communications, navigation, surveying and understanding various aspects of space weather effects on technological systems. Studies have shown that ionospheric disturbances have characteristic features, such as diurnal double peak structures, that differ from effects associated with major geomagnetic storm, Pi et al (1995). Diurnal double peak structures have been observed to have varying magnitudes with respect to the background ionosphere. In addition there has not been convincing evidence that these structures are caused solely by geomagnetic disturbances, Katamzi et al (2012). In fact, a study by Katamzi et al. (2016) in a case study showed evidence of tides having an influence on their generation, from the observations of sporadic E layer. However, this needs further investigation. Therefore the student will use long-term ionosonde and GPS data to investigate the relationship between sporadic E layer and double peak structures over South Africa.

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