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Structure function analysis of plasma density fluctuations during total loss of lock of GPS signal events

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Ionospheric irregularities are fluctuations or structures of plasma density that affect the propagation of radio signals. Whenever large-scale irregularities break up into meso and small-scale irregularities, these processes become similar to a turbulence cascade. In order to have a better comparison between this and plasma density irregularities, we study different orders of structure functions of plasma density of total loss of lock events measured with the faceplate measurements of plasma density and the GPS measurements from the Swarm mission. Total loss of lock of GPS signal is a physical proxy for severe degradation of GPS signals. In addition to different orders of structure-function, we study the existence of self-similarity or multifractality of plasma density of total loss of lock events to investigate any possible intermittent fluctuations.