

Lower atmospheric effects on the generation of equatorial spread F

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The potential importance of lower atmospheric wave seeding of equatorial spread-F and plasma depletions has been the subject of numerous studies over the last few decades. We use extensive coherent scatter radar observations from Peru and Brazil and in-situ satellite measurements to investigate the response of the unstable F-region to lower atmospheric disturbances. The identification of lower atmospheric forcing first requires the removal of geomagnetic activity driven effects, which are particularly important near low solar flux periods. We show that the temporal and spatial characteristics associated with lower atmospheric forcing has strong seasonal, solar flux, and longitudinal dependence. Our results suggest a significant variation on the lower atmospheric waves which can effectively seed upper atmospheric plasma irregularities. Our satellite measurements show that lower atmospheric seeding appears to be most effective near the South American equatorial region.