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## Long-Term Trends in the Equatorial Ionization Anomaly

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Due to the special geometry of the electric and magnetic fields at the equator, the vertical ExB drift removes plasma from the geomagnetic equator via an equatorial plasma fountain. This process forms the equatorial ionization anomaly (EIA) by creating the crests at/around  $20^\circ$  latitudes on either side of the geomagnetic equator. It has been reported that symmetric/asymmetric structure and latitudinal extent of the EIAs are affected by the electric fields and thermospheric neutral winds. We investigate the long-term trends in the equatorial ionization anomaly (EIA) and associated phenomena over the South American low-latitude region. These long-term analyses help to develop/update the empirical model of various ionospheric parameters. The EIA features are analyzed using the ground-based Global Positioning System (GPS)-total electron content (TEC) data. We also compare the TEC in EIA obtained from the latest International Reference Model (IRI) model with the observed GPS-TEC data for seasons, different levels of solar activity, and geomagnetic conditions. Finally, We discuss the mechanisms, drivers, and impacts of the EIAs in upper atmospheric electrodynamics.