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Investigation of the role of various neutral and electrodynamical processes in the variabilities exhibited by O_1D 630.0nmdayglow through optical measurements

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As is well known, the modulation of the quiet time thermospheric O^1D 630nm dayglow intensity is controlled by photochemistry and the large and small-scale neutral dynamical processes. In addition, the equatorial electrojet parameters also have their definite imprint on the O^1D 630nm dayglow intensity through electro-dynamical coupling over the magnetic equator. The evolution of Equatorial ionization anomaly (EIA) is the coupling process that links the changes of measured dayglow intensity to the equatorial electrodynamics. The relative importance of these neutral and electrodynamical processes under different geophysical conditions is an unexplored topic and is extremely important in the investigation of the thermosphere-ionosphere system. In this context, this paper presents the variabilities in the daytime thermospheric airglow as measured over Trivandrum, a dip equatorial station in India vis-à-vis the evolution and growth of Equatorial ionization anomaly (EIA) and Equatorial electrojet (EEJ) during varying geophysical conditions. In the light of the apportionment due to these processes and their comparison with the estimates obtained airglow models.