



Gravity Wave Signatures as Determined by Istanbul Dynasonde Observations

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A recently established Dynasonde station in Istanbul (41N, 29E) provides an opportunity to study the midlatitude ionospheric disturbances. Ionospheric parameters including critical frequencies, electron density derived, maximum electron density heights, TEC and other related 79 parameters produced for E and F layers using a newly developed NeXtYZ technique and other Dynasonde analysis routines are recorded since October 2012. The monthly variations of electron density in F layer track the solar radiation smoothly from September to May. However, lots of wave activity were recorded from May to September especially during daytime but extending thorough the midnight. In addition to this, individual visual scans of the ionograms generated every 4 minute indicate the presence of local wave activities especially in the morning hours from 6 am in local time toward noon during the fall and some in winter months. The first signatures of these wave structures, known as TIDs, start at the F region altitudes about 300-400 km and are seen to move towards lower altitudes of 200 km with periodicities of about 20-25 minutes. The magnitude of the variations in electron density varies by a factor of 2 within the TID structures. The TIDs are known to be caused by the upward propagating gravity waves from the lower atmosphere. In this study, we will be presenting the statistics of the wavy structures along with the general characteristics of F layer based on 12 months of data measured by the Istanbul Dynasonde. Case studies will also be shown on individual events. The atmospheric dynamics resulting in TIDs will be discussed based on these observations and comparisons will be given with other studies available in the literature.