3次元スペクトル法を用いた中規模伝播性電離圏擾乱の成長速度の 統計的推定
Statistical estimation of growth time of medium-scale traveling ionospheric disturbances by three dimensional spectral method

*池田 孝文[1]、齊藤 昭則[1]
*Takafumi Ikeda[1], Akinori Saito[1]

1. 京都大学大学院理学研究科地球物理学教室
1. Department of Geophysics, Graduate School of Science, Kyoto University

Medium scale traveling ionospheric disturbance is one of phenomenon in ionosphere and has been long studied. Nighttime MSTID will be caused by Perkins instability. Linear growth time(e folding time) of Perkins instability is very slow as growth time from random thermal noise . Therefore , we expect explanation of growth of MSTID by including electric filed of Sporadic E layer . However, we have not almost estimated observational growth time of MSTID.

Using this method, we statistically estimated growth rates of nighttime MSTID in japan in summer 2014 observed by GNSS. We used 3DFFT for total electron content(TEC) grid data ,and estimated propagation velocity. Using this velocity, we tracked movement of one wavefront of MSTID. We estimated the maximum growth time of each event by using wavenumber spectra when tracking. As a result, growth time is slower than 16 minutes. Propagation direction when growth time is fastest is southwestward(205° - 245°). Growth time is maximum when 240°. This magnitude is too slow as growth time of MSTID, and is within the range of one perkins instability expects. We will show the detail about the relation between this growth time and both mechanisms, and also show the solar activational and the seasonal dependence of growth time.

キーワード：中規模伝播性電離圏擾乱、GPS-TEC、パーキンス不安定性、３次元スペクトル法
Keywords: Medium-scale traveling ionospheric disturbances, GPS-TEC, Perkins instability, Three dimensional spectral method