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Study of equatorial night-time MSTIDs using the data of airglow images, neutral winds, and ionospheric heights

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In our previous study, we observed night-time medium-scale traveling ionospheric disturbances (MSTIDs) at Kototabang (0.2S, 100.3E, geomagnetic latitude (MLAT): 10.6S), Indonesia during 7 years from October 2002 to October 2009. We took 630-nm night airglow images by using a highly-sensitive all-sky airglow imager. However we didn't compare these observations with thermospheric neutral winds which can be observed by Fabry-Perot interferometers (FPIs) and ionospheric heights which can be observed by ionosondes.

We analyzed two different events of MSTIDs observed at Kototabang, Indonesia after October 2009. One event is that northeastward MSTID was observed from 15 to 16 UT and southwestward MSTID was observed from 16 to 17 UT on 11 September 2010. The other event is that quasi-periodic southward MSTIDs were observed from 16 to 18 UT on 10 December 2010. The former event seems to be waves generated from midnight temperature maximum (MTM). The latter event is similar to MSTIDs observed in our previous study because they were quasi-periodic waves moving southward. In the presentation, we discuss detailed characteristics of these two events by using the data of the thermospheric neutral winds observed by a FPI and the data of the ionospheric heights observed by an ionosonde.

Keywords: airglow, equatorial thermosphere, MSTID