

A study of the effect of solar activity on the meteor height distribution in the equatorial region of Indonesia.

*Mario Batubara^{1,2}, Masa-yuki Yamamoto¹, Waleed Madkour¹, Timbul Manik²

1. Kochi University of Technology, 2. Indonesian National Institute of Aeronautics and Space

We investigate the distribution of meteor height and number of meteor echo for 13 years observed by the Meteor Wind Radar (MWR) at Kototabang (0.20° S, 100.32° E) and Biak (1.17° S, 136.10° E) in Indonesia. We aim to disclose the relation between solar activity represent by solar radio index and the fluctuate occurrence of meteor peak height in the equatorial region. In summary, (I) we found that the observed daily meteor count rates at Kototabang and Biak in the period from 2003 to 2011 and 2011 to 2016, showing the number of meteor echoes that may could be used in further analysis statistically. This results is consistent with the previous study [e.g. Liu et al., 2016 and Yi et. Al, 2016]; (ii) the periodic trend of meteor count rate diurnally shows the peak meteor count rate occur in the middle of the year; (iii) the meteor peak heights annually observed by both meteor radar in Indonesia. Our results remark that the solar activity is a prominent factor of the meteor peak heights variation. However we also consider another factor to be investigated, namely total number density and mean temperature at 90 km around Indonesian latitude may relate with the solar sunspot number and solar radio index. We particularly attribute the result (iii) to the effects of solar activity and total number density and mesosphere temperature, that is, we suggest that the solar activity expressed by solar radio index and solar sunspot number could cause the variation occurrence on the meteor peak heights.

Keywords: meteor distribution, solar activity phase, density and temperaure of the atmosphere