# Gravity wave momentum flux estimated from airglow images in the equatorial mesopause region

**S. Suzuki**(1), K. Shiokawa(1), Y. Otsuka(1), T. Ogawa(1), M. Kubota(2), T. Nakamura(3)

(1)Solar-Terrestrial Environment Laboratory, Nagoya University, (2)National Institute of Information and Communications Technology, (3)Research Institute for Sustainable Humanosphere, Kyoto University

We developed a code to estimate vertical fluxes of horizontal momentum carried by small-scale ($<$ 100 km) atmospheric gravity waves from OH airglow images. Propagation direction, horizontal wavelength, horizontal phase speed, and intensity perturbation of gravity waves are estimated from the two-dimensional cross-power spectrum of two sequential time-differenced images, by a procedure similar to that developed by Tang et al. [IEEE Trans, pp. 103-109, 2005]. We also performed a process to remove the Milky Way structure from the airglow image. With these parameters and the cancellation factor introduced by Swenson and Liu [JGR, pp. 6271-6294, 1998], momentum flux is estimated from the polarization relations of gravity wave. We applied the method to the airglow images obtained at Kototabang, Indonesia (0.2S, 100.3E) for 26 nights from October 2002 to June 2005. The background wind data, which were essential for deriving the intrinsic parameters of gravity waves, were simultaneously measured by a meteor radar at Kototabang. Almost all gravity waves we extracted from airglow images had horizontal wavelengths of 30-60 km, the apparent phase speeds of 30-70 m/s, and intensity perturbations of less than 2.0%. The momentum flux averaged over all the gravity wave events is 1.4 $m^2/s^2$. In the Asian monsoon season (June-August), some of wave components carried larger momentum than other season.