

Processing flow to public science archive of low-cost airglow imaging network

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Atmospheric gravity waves significantly contribute to the wind/thermal balances in the mesosphere and lower thermosphere (MLT) through their vertical transport of horizontal momentum originated from meteorological disturbances in the lower atmosphere. Airglow imaging is a useful technique to observe two-dimensional structure of small-scale (<100 km) gravity waves in the MLT region and has been widely used to investigate behaviours of the waves. Recent studies with simultaneous/multiple airglow cameras have derived spatial extent of the MLT waves. Such network imaging observations are advantageous to ever better understanding of coupling between the lower and upper atmosphere via gravity waves and will become increasingly important. In this study, we newly developed low-cost airglow cameras to enlarge the airglow imaging network. Each of the cameras has a fish-eye lens with a 185-deg field-of-view and equipped with a CCD video camera (WATEC WAT-910HX) ; the camera is small (W35.5 x H36.0 x D63.5 mm) and inexpensive, much more than widely-used airglow camera, and has a CCD sensor with 768 x 494 pixels that is highly sensitive enough to detect the mesospheric OH airglow emission perturbations. For multipoint network observations using the system, however it is necessary to improve on data flow to make vast amounts of image data available to the public.

In this presentation, we will share some results of performance evaluation of the new camera and development of data flow. Outreach and educational activities based on this research will be also reported.