# Performance evaluation of low-cost airglow camera for mesospheric gravity wave measurements: Part 2

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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. It has been reported that the gravity wave momentum flux preferentially associated with the scale of the waves; the momentum fluxes of the waves with a horizontal scale of 10-100 km are particularly significant. 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 used to investigate global behavior 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.

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 the airglow camera used for the existing ground-based network (Optical Mesosphere Thermosphere Imagers (OMTI) operated by Solar-Terrestrial Environmental Laboratory, Nagoya University), and has a CCD sensor with 768 x 494 pixels that is highly sensitive enough to detect the mesospheric OH airglow emission perturbations.

In this presentation, we will report some results of performance evaluation of this camera made at Shigaraki (35-deg N, 136-deg E), Japan, where is one of the OMTI station. By summing 15-images (i.e., 1-min composition of the images) we recognized clear gravity wave patterns in the images with comparable quality to the OMTI images. Outreach and educational activities based on this research will be also reported.