

# Ozone disturbances associated with gravity waves as revealed in the 3-hourly ozonesonde observation at Fairbanks, Alaska

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An observation campaign including intensive launches of ozonesondes was conducted at Fairbanks (64.8N, 147.9W), Alaska, during 23--30 August 2003. The objectives are intervalidation among ground-based, satellite-borne and in-situ (balloon-borne) instruments and examination of small-scale ozone variation in the upper troposphere and lower stratosphere. Twenty-two electrochemical concentration cell (ECC) ozonesondes (En-Sci model 2Z) and some additional radiosondes (Vaisala RS80-15GH) were launched from the University of Alaska, Fairbanks, at least once per day synchronized with times of nearby measurements of the Improved Limb Atmospheric Spectrometer-II (ILAS-II) on board the Advanced Earth Observing Satellite-II (ADEOS-II). During from 18 UTC 26 August to 04 UTC 28 August, we performed an intensive observation with 3-hourly launches of ozonesondes. The ozonesondes provide location and horizontal wind data obtained by built-in GPS receivers as well as vertical profiles of ozone concentration, temperature and relative humidity from surface to about 30 km.

A gravity-wave like feature both in the horizontal wind components and ozone was observed by the 3-hourly observation. Each component shows clear phase descent with time. The vertical wavelength is about 2 km. The direction of propagation was estimated as southward or northward from the phase relation between the horizontal wind components. The perturbation in ozone is almost in phase with that in the eastward wind component. This is consistent with that the ozone disturbances were induced by vertical advection associated with the southward propagating gravity waves.