

Development of the software to automatically analyze gravity waves observed from MF radars and the initial results

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One of the fundamental mechanisms in mesospheric dynamics is the meteorological concept of geostrophic balance. The combination between the pressure gradient caused by solar heating, the Coriolis force, and the momentum transfer due to wave breaking near the critical level provides an approximate balance in mesospheric winds. Temporal variations in gravity wave activities observed with three MF radars at Poker Flat, Alaska (65 N), Wakkanai (45 N), and Yamagawa (31 N) are not always consistent with those in the observed mean zonal winds, in particular late summer. We developed the software to automatically analyze large data set obtained from MF radars to study effects of the gravity wave on mesospheric and lower-thermospheric mean winds. In this paper, we will show gravity wave parameters such as the oscillation period, the wavelength, and the phase velocity from this software. The propagation direction of the gravity waves might be estimated using temperature fluctuations, which can be calculated from electron density fluctuations [Sugiyama et al., 1988]. Using these parameters, we try to estimate the acceleration of the mean wind.