

## Relationship between MU radar QP echoes and atmospheric dynamics

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In the summer of 2002, we observed quasi-periodic (QP) echoes at 85-120 km altitudes with the MU radar and simultaneously 557.7 nm airglow phenomena at around 96 km with optical imagers to reveal the plasma and neutral air dynamics related to QP radar echoes. The results suggest the following: (1) QP echo regions moved eastwards, contrary to previous observations showing a predominant southwestward movement. (2) In accord with increase (decrease) in the absolute 557.7 nm intensity, the echo altitudes increase (decrease). (3) Enhanced airglow and QP echo regions moved eastward, consistent with neutral wind motions derived from a Fabry-Perot interferometer. (4) Periods of airglow perturbations are in harmony with those of the QP echoes. (5) Occasionally, very high Doppler velocities (less than 150 m/s) appear at around 90 km, suggesting the occurrence of high-speed neutral winds in localized area. Possible relationships between the dynamics related to the QP echoes and neutral winds are discussed.