On the Opposite Nature of Velocity Reversal Pattern in the Negative And the Positive Sloped QP Striations: What it Represents?

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Gadanki radar observations of E-region field-aligned irregularities are analyzed to study the Doppler characteristics of QP echoes with negative and positive sloped striations. It is found that while the QP echoes with negative sloped striations occur most of the time over Gadanki, QP echoes with positive sloped striations are also observed occasionally. We have shown that, in a normal continuous echoing region occurring above 100 km, the velocities are positive at the top of the echoing region and negative at the bottom. Further, in case of QP striations the Doppler velocities associated with the QP striations, the velocities are again found to be positive at the top of the striations and negative at the bottom. However, there is a temporal reversal of velocity in between, such that the velocities are changing from negative to positive in case of negative sloped striations and positive to negative in case of positive sloped striations. These features are explained with the help of a conceptual model considering the polarization processes associated with the action of zonal component of tides and gravity waves in the manifestation of QP echoes.

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