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COMMENT ON "KINEMATICS OF THE TRANSPORT OF MOMENTUM BY TILTED TROUGHS"

I read Asnani's (1975) paper with great interest since it is similar to an analysis that I performed, Gruber (1974), at about the same time. The principal difference being that Asnani dealt with non-divergent flows and I treated divergent flows.

I showed that one can infer the direction of momentum transports, $\overline{u'v'}$ from the slope of the streamline pattern only for non-divergent flow fields. If the flow field is divergent it is possible to have momentum transports in a direction contrary to what would be inferred from the slopes of the trough and ridge pattern in a non-divergent flow field. Although I only explicitly treated the momentum transports, the results are applicable to the convergence of momentum flux, $\partial \overline{u'v'}/\partial y$. Thus, Asnani's case of a linear slope with latitude yielding $\overline{u'v'} > 0$ and $\partial \overline{u'v'}/\partial y = 0$ can yield the opposite results if the flow is divergent.

One might expect strongly divergent flows in tropical disturbances where considerable latent heat is released. As a consequence, applying the rules Asnani developed for determining the momentum flux and its convergence may lead to erroneous conclusions.

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