



INERTIAL INSTABILITY FLOW IN THE TROPOSPHERE OVER SURINAME DURING THE SOUTH AMERICAN MONSOON

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Weekly sonde observations in Suriname, supported by ECMWF analyses and theory, are used to analyze the recurrence of inertial instability as the ITCZ migrates over land during the South American Monsoon. A layer of cooler air from the Atlantic Ocean is then advected southward over Suriname in the shape of a cold front, displacing the warmer air over the continent. The return flow northward, by the upper branch of the Hadley cell, is a region where inertial instability pervades due to cross-Equatorial advection of anticyclonic vorticity and the proximity of the subtropical jet. This unstable region evidently leads to the regular formation of a meridional sub-cell between the tropopause and the Hadley cell, conform the inertial frequency of this latitude, and contributes to the Hadley cell formation through northward acceleration in the upper branch. The moist saturated conditions in the lower troposphere also allows for inertial instability, which could possibly explain the southward acceleration experienced in the lower branch of the Hadley cell. The vertical dimension of the Hadley cell could be stretched by deep convection near the Equator to the observed depth.