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IMPACT OF HORIZONTAL AND VERTICAL TRANSPORT TO OZONE DISTRIBUTION IN THE TROPICAL UT/LS

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Within the HIBISCUS project, long series of ozone profiles between 10 and 25 km have been obtained at almost constant latitude in the tropics by remote sensing from circumnavigating IR Montgolfier (MIR) long duration balloons in February – March 2001 and 2004. A method for evaluating the amplitude of changes due to horizontal and vertical transport has been developed making use of Potential Vorticity (PV) fields and a vertical stability index derived from ECMWF analyses. The analyses suggest that 70% of the observed ozone zonal variability in the UTLS could be explained by quasi-horizontal exchange with the mid-latitude stratosphere and only 15-20% to vertical transport of low ozone from surface layers. The very low residual variability of 5-8% after removing those contributions suggests that local photochemical ozone production could be small. Very similar results reached from the analysis 13 ECC ozonesondes flown during the same period from Bauru (22˚S, 49W) in Brazil in 2004 indicates that the conclusion is still valid at local scale.