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Atmos. Chem. Phys., 6, 5391–5397, 2006

www.atmos-chem-phys.net/6/5391/2006/

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## Accuracy of analyzed temperatures, winds and trajectories in the Southern Hemisphere tropical and midlatitude stratosphere as compared to long-duration balloon flights

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**Abstract.** Eight super-pressure balloons floating at constant level between 50 and 80 hPa and three Infra-Red Montgolfier balloons of variable altitude (15 hPa daytime, 40–80 hPa night time) have been launched at 22° S from Brazil in February–May 2004 in the frame of the HIBISCUS project. The flights lasted for 7 to 79 days residing mainly in the tropics, but some of them passed the tropical barrier and went to southern midlatitudes. Compared to the balloon measurements just above the tropical tropopause the ECMWF operational temperatures show a systematic cold bias of 0.9 K and the easterly zonal winds are too strong by 0.7 m/s. This bias in the zonal wind adds to the ECMWF trajectory errors, but they still are relatively small with e.g. about an error of 700 km after 5 days. The NCEP/NCAR reanalysis trajectory errors are substantially larger (1300 km after 5 days). In the southern midlatitudes the cold bias is the same, but the zonal wind bias is almost zero. The trajectories are generally more accurate than in the tropics, but for one balloon a lot of the calculated trajectories end up on the wrong side of the tropical barrier and this leads to large trajectory errors.

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Citation: Knudsen, B. M., Christensen, T., Hertzog, A., Deme, A., Vial, F., and Pommereau, J.-P.: Accuracy of analyzed temperatures, winds and trajectories in the Southern Hemisphere tropical and midlatitude stratosphere as compared to long-duration balloon flights, Atmos. Chem. Phys., 6, 5391–5397, 2006. [Bibtex](#) [EndNote](#) [Reference Manager](#)



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