



Impact of temperature assimilation of a limb sounder (MIPAS) as compared with that of a nadir instrument (TOVS)

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The impact of assimilation of MIPAS temperature (a limb sounder) in a new coupled stratospheric dynamical-chemical model (GEM-BACH) is evaluated and compared with the known benefit of TOVS (nadir sounder) assimilation. The experiment as a form of OSE (Observation Simulating Experiment) is performed with and without a special bias correction of AMSU-A unit based on MIPAS. Combining limb and nadir information should give, in theory, a higher content of information. However, it is shown that in all the experiments that it is not the case and reveals the difficulty of assimilating various instruments having different characteristics. MIPAS temperature assimilation alone turns out to have more positive impact in the stratosphere than combined assimilation (MIPAS+TOVS) or TOVS assimilation alone. This impacts the future use of assimilation of a growing source of meteorological and chemical observations and questions our ability to adequately address the problem of multiple instrument assimilation even if careful bias correction are applied to individual instruments.