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A tropically controlled transition layer above the lowermost stratosphere as derived from *in situ* measurements of the SPIRALE balloon borne instrument

M. Pirre and N. Huret

Laboratoire de Physique et Chimie de l'Environnement, CNRS and Université d'Orléans, France

The lowermost stratosphere at mid-latitude is usually defined as the region between the midlatitude tropopause and the isentropic surface 380 K. This region contains older stratospheric air advected by the mean meridional circulation downward across the 380 K surface. This older air is mixed with more recent air from the tropical troposphere which is transported isentropically into the lowermost stratosphere. The relative importance of older and more recent air depends on season. In the Northern hemisphere, recent air has been found to be maximum in September-October. The balloon-borne SPIRALE instrument has flown on October 2, 2002 above Aire sur l'Adour (44N, 0W). Simultaneous *in situ* measurements of CH_4, N_2O, CO, O_3 and HCl mixing ratio with high vertical resolution have been made at the ascent and the descent of the balloon covering the lowermost stratosphere and the overworld above. Correlation of the abundance of N_2O and CH_4 will be presented which confirms that recent tropospheric air is prevailing in the midlatitude lowermost stratosphere in October. From this correlation as well from the correlation of the abundance of HCl and O_3 and from the CO vertical profile it will be shown that tropical air is also present above the 380 K surface. This confirms the existence of a Tropically Controlled Transition Layer at midlatitude between the lowermost stratosphere and the overworld already pointed out by Rosenlof (1997). The location of the upper level of this layer at the SPIRALE location on October 2, 2002 will be derived from the correlation curves.