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Increased Northern Hemispheric carbon monoxide burden in the troposphere in 2002 and 2003 detected from the ground and from space

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Abstract. Carbon monoxide total column amounts in the atmosphere have been measured in the High Northern Hemisphere (30°-90° N, HNH) between January 2002 and December 2003 using infrared spectrometers of high and moderate resolution and the Sun as a light source. They were compared to ground-level CO mixing ratios and to total column amounts measured from space by the Terra/MOPITT instrument. All these data reveal increased CO abundances in 2002-2003 in comparison to the unperturbed 2000-2001 period. Maximum anomalies were observed in September 2002 and August 2003. Using a simple two-box model, the corresponding annual CO emission anomalies (referenced to 2000-2001 period) have been found equal to 95Tg in 2002 and 130Tg in 2003, thus close to those for 1996 and 1998. A good correlation with hot spots detected by a satellite radiometer allows one to assume strong boreal forest fires, occurred mainly in Russia, as a source of the increased CO burdens.

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