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## Variability of springtime transpacific pollution transport during 2000–2006: the INTEX-B mission in the context of previous years

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**Abstract.** We analyze the transport of pollution across the Pacific during the NASA INTEX-B (Intercontinental Chemical Transport Experiment Part B) campaign in spring 2006 and examine how this year compares to the time period for 2000 through 2006. In addition to aircraft measurements of carbon monoxide (CO) collected during INTEX-B, we include in this study multi-year satellite retrievals of CO from the Measurements of Pollution in the Troposphere (MOPITT) instrument and simulations from the chemistry transport model MOZART-4. Model tracers are used to examine the contributions of different source regions and source types to pollution levels over the Pacific. Additional modeling studies are performed to separate the impacts of inter-annual variability in meteorology and dynamics from changes in source strength.

Interannual variability in the tropospheric CO burden over the Pacific and the US as estimated from the MOPITT data range up to 7% and a somewhat smaller estimate (5%) is derived from the model. When keeping the emissions in the model constant between years, the year-to-year changes are reduced (2%), but show that in addition to changes in emissions, variable meteorological conditions also impact transpacific pollution transport. We estimate that about 1/3 of the variability in the tropospheric CO loading over the contiguous US is explained by changes in emissions and about 2/3 by changes in meteorology and transport. Biomass burning sources are found to be a larger driver for inter-annual variability in the CO loading compared to fossil and biofuel sources or photochemical CO production even though their absolute contributions are smaller. Source contribution analysis shows that the aircraft sampling during INTEX-B was fairly representative of the larger scale region, but with a slight bias towards higher influence from Asian contributions.

- Final Revised Paper** (PDF, 1818 KB)
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