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Top-down estimates of carbon monoxide fluxes from tropical biogenic emissions

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Biogenic emissions in the tropics and sub-tropics produce a significant portion (∼15%) of the global carbon monoxide (CO) budget. We present results from a new top-down estimate of CO fluxes from this source using a Markov Chain Monte Carlo (MCMC) Bayesian approach to re-partition CO fluxes following inversion of Measurements Of Pollution In The Troposphere (MOPITT) CO observations with the GEOS-Chem model. We compare these results to the prior information for CO from biogenic non-methane volatile organic compounds (NMVOCs) from GEOS-Chem, which uses the Model of Emissions of Gases and Aerosols from Nature (MEGAN) for biogenic emissions and to top-down estimates of isoprene emissions using Ozone Monitoring Instrument (OMI) formaldehyde observations. We find similar seasonality in the posterior CO and top-down isoprene estimates for equatorial West Africa, which both vary significantly from the MEGAN apriori. This method for estimating biogenic sources of CO has the potential for diagnosing decadal scale changes in emissions due to land-use change and climate variability.