

Impact of convective outflow and biomass burning into the tropical lower stratosphere as diagnosed from satellite observations

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Limb- and nadir-viewing space-borne measurements of atmospheric constituents (N₂O, CH₄, H₂O and CO) and related products (temperature, cloud occurrence frequency, fire pixels, and outgoing longwave radiation) are used to assess the impact of convective outflow and biomass burning upon the tropical lower stratosphere during the March-May 2002-2004 period. We show that over Western Africa, Northern South America, and Indonesia, long-lived species in the Tropical Tropopause Layer (TTL) are affected by one or both phenomena. The rapid and strong vertical outflow over Central Africa is also responsible for the dehydration of the cold TTL over this area. Although convection is present over Western Pacific, it does not penetrate into the TTL and, consequently, does not alter the distribution of long-lived species.