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## Space-borne observations link the tropical atlantic ozone maximum and paradox to lightning

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**Abstract.** The potential enhancement of tropospheric column ozone values over the Tropical Atlantic Ocean on a seasonal basis by lightning is investigated using satellite derived ozone data, TRMM lightning data, ozonesonde data and NCEP reanalysis during 1998-2001. Our results show that the number of lightning flashes in Africa and South America reach a maximum during September, October and November (SON). The spatial patterns of winds in combination with lightning from West Africa, Central Africa and South America is likely responsible for enriching middle/upper troposphere ozone over the Tropical South Atlantic during SON. Moreover, lightning flashes are high in the hemisphere opposite to biomass burning during December, January, and February (DJF) and June, July and August (JJA). This pattern leads to an enrichment of ozone in the middle/upper troposphere in the Southern Hemisphere Tropics during DJF and the Northern Hemisphere Tropics during JJA. During JJA the largest numbers of lightning flashes are observed in West Africa, enriching tropospheric column ozone to the north of 5°S in the absence of biomass burning. During DJF, lightning is concentrated in South America and Central Africa enriching tropospheric column ozone south of the Equator in the absence of biomass burning.

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