



Modeling the formation of tropical rings of atomic bromine and iodine

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Very short-lived (VSL) bromo- and iodocarbons are produced at a prodigious rate by ocean biology and these source compounds (SGVSL), together with their degradation inorganic products (PGVSL), are lofted by vigorous convection to the tropical tropopause layer (TTL). Using a state-of-the-art photochemical mechanism within a global model, we investigate the partitioning and loading of reactive inorganic halogens within the TTL. The specific low ozone and low temperature conditions of this region of the atmosphere changes the steady-state between halogen atoms and oxides, making the atoms the dominant species. We suggest that this leads to the formation of two daytime “tropical rings” of both atomic bromine and iodine that circle the tropics with the sun. In addition to a description of this photochemical phenomenon, this communication the partitioning of inorganic halogen reservoirs within the TTL and assess its relevance for the injection of bromine to stratosphere.