

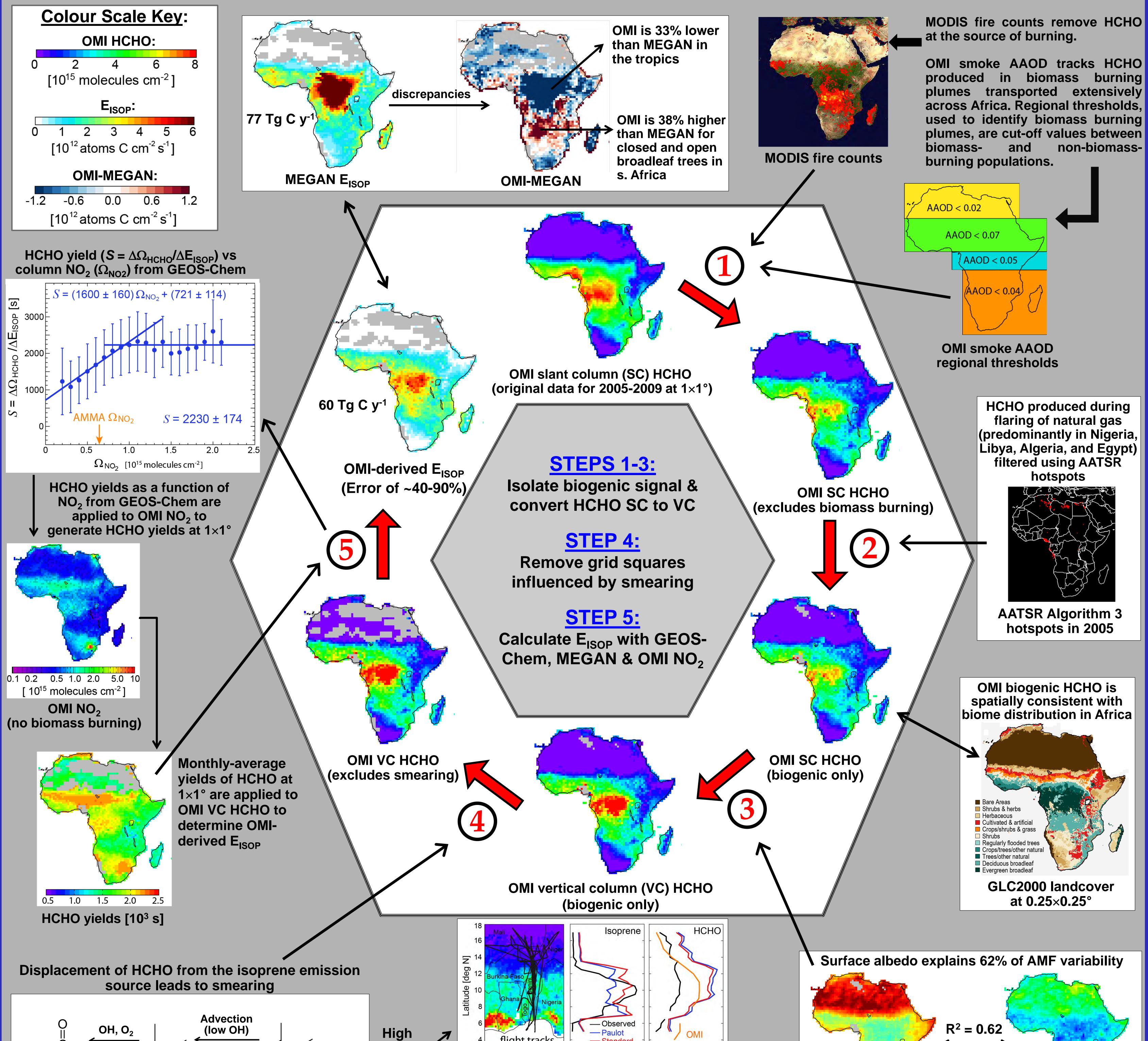
Isoprene emissions in Africa inferred from OMI HCHO

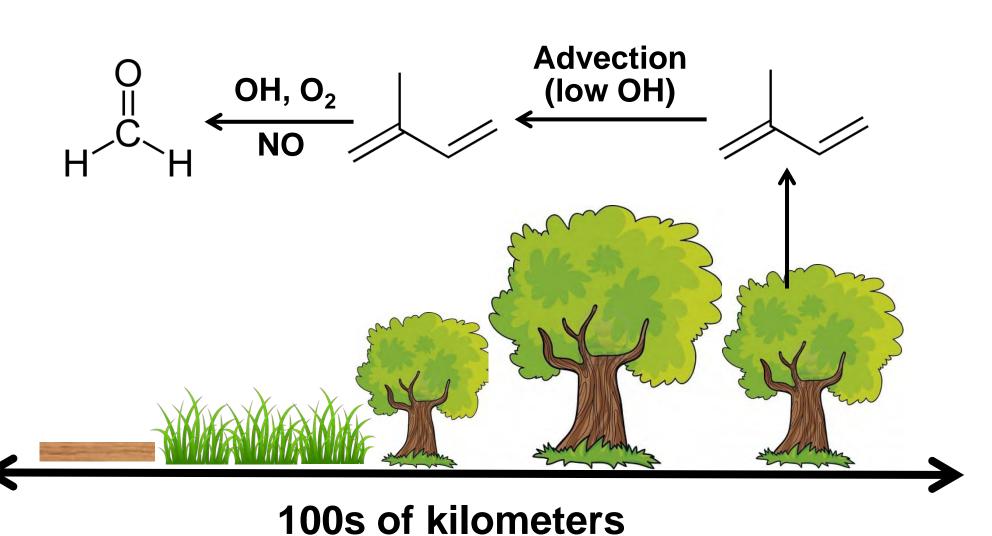
Eloïse Marais (emarais@fas.harvard.edu)¹, D. Jacob¹, T. Kurosu², K. Chance³, J. Murphy⁴, C. Reeves⁵, G. Mills⁵, S. Casadio⁶, D. Millet⁷, M. Barkley⁸, F. Paulot¹, J. Mao⁹ ¹Harvard University, ²JPL, ³Harvard-Smithsonian, CfA, ⁴U. Toronto, ⁵U. East Anglia, ⁶IDEAS, ⁷U. Minnesota, ⁸U. Leicester, ⁹U. Princeton

Isoprene accounts for ~50% of global emissions of non-methane volatile organic compounds. It is a major precursor of secondary organic aerosols and tropospheric ozone, impacting human health, climate and air quality. Formaldehyde satellite observations (Ω_{HCHO}) have been used to better quantify isoprene emissions (E_{ISOP}) and test current emission inventories, such as the Model of Emissions of Gases and Aerosols from Nature (MEGAN). Africa is a major source of E_{ISOP}, but has thus far received little attention.

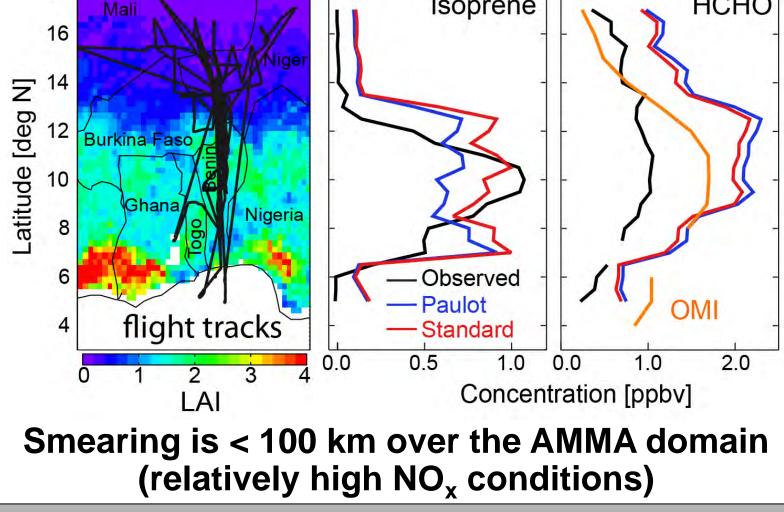
Here we estimate E_{ISOP} for Africa using OMI HCHO observations during 2005-2009. We remove HCHO produced from biomass burning and anthropogenic sources with proxy observations from space. We identify and exclude HCHO displaced from the source of E_{ISOP} with the GEOS-Chem chemical transport model and MEGAN.

Procedure to isolate a biogenic HCHO signal from OMI and convert biogenic Ω_{HCHO} to E_{ISOP} **Colour Scale Key:** OMI is 33% lower at the source of burning. **OMI HCHO:** than MEGAN in





Grid squares impacted by displacement of HCHO (and filtered out using GEOS-Chem) include grid squares located west of the Congo Basin and with low E_{ISOP}.



NO_x

Low OH;

high E_{ISOP}

3°S - 3°N ~200-300 km smearing to the west in central Africa (region with high E_{ISOP} and low levels of OH) Longitude [deg]

OMI surface albedo Air mass factor at 345 nm (AMF) for 2005-2009

Smearing under low NO_x conditions makes the largest contribution (35-84%) to errors in the OMI-derived isoprene emissions.