



## Air Quality in Nigeria as Observed from Space

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Elevated levels of formaldehyde (HCHO) in Nigeria, as observed using the Ozone Monitoring Instrument, indicate a large source of anthropogenic volatile organic compounds (VOCs). We isolate an anthropogenic signal of HCHO by removing the biomass burning and biogenic signal. We use space-based observations of gas flare hotspots, carbon monoxide, methane, nitrogen dioxide and glyoxal to identify emission source locations – city centers (Lagos, Abuja, Port Harcourt); Niger Delta petroleum and natural gas extraction; and intense biofuel use in populous rural regions. GEOS-Chem underestimates anthropogenic HCHO in Nigeria and we use aircraft observations of VOCs made over Lagos during the AMMA campaign (Jul-Aug 2006) and SCIAMACHY methane observations over the Niger Delta to address this discrepancy. After updating GEOS-Chem VOC emissions in Nigeria we find that local emissions increase surface ozone north of the Nigerian coastline (persistent onshore winds) and ozone and peroxyacetyl nitrate in the free troposphere stretching from the Gulf of Guinea to the east coast of South America (monsoonal convection and advection along a branch of the African Easterly Jet).