Atmospheric Formaldehyde Trend and its Source Attributions in the Recent Decades

Junhua Liu[1,2], Sarah A. Strode[1,2], Qing Liang[2], Bryan N. Duncan[2], Peter R. Colarco[2], Michael E. Manyin[2,3], Zolal Ayazpour[4], Gonzalo Gonzalez Abad[4]

1: Morgan State University, Baltimore, MD, USA
2: NASA Goddard Space Flight Center, Greenbelt, MD, USA
3: Science Systems and Applications, Inc, Lanham, MD, USA
4: Center for Astrophysics, Harvard, MA, USA

Abstract Text:
Formaldehyde (CH_2O) is one of the most important reactive trace gases in the atmosphere with an important role in tropospheric chemistry and in the control of surface air quality. Sources of CH_2O includes direct emissions and in situ production from the oxidation of volatile organic compounds (VOCs). In this study, we investigate spatial-temporal variations in atmospheric CH_2O and how changes in CH_2O couple with tropospheric ozone variability during the past two decades using recently available retrievals from the Ozone Monitoring Instrument (OMI) aboard NASA's Aura satellite and the RefD1 simulation from the NASA Goddard Earth Observing System Chemistry Climate Model (GEOSCCM). Our initial analysis provides evidence of significant increases in atmospheric CH_2O concentrations over several of the world's major anthropogenic regions, including China, India, and the Middle East, and several biomass burning regions, including South America, southern Africa, boreal regions and Indonesia. We furthermore will identify regional source contributions to CH_2O trends, including anthropogenic VOCs emissions, biogenic isoprene emissions and open fires. In particular, we will focus on anthropogenic emission regions to examine the role of changing anthropogenic *VOC emissions* on CH_2O abundance.