Impact of emissions and long-range transport on multi-decadal aerosol trends: Implications for air quality and climate

Mian Chin, NASA Goddard Space Flight Center

We present a global model analysis of the impact of long-range transport and anthropogenic emissions on the aerosol trends in the major pollution regions in the northern hemisphere and in the Arctic in the past three decades. We will use the Goddard Chemistry Aerosol Radiation and Transport (GOCART) model to analyze the multi-spatial and temporal scale data, including observations from Terra, Aqua, and CALIPSO satellites and from the long-term surface monitoring stations. We will analyze the source attribution (SA) and source-receptor (SR) relationships in North America, Europe, East Asia, South Asia, and the Arctic at the surface and free troposphere and establish the quantitative linkages between emissions from different source regions. We will discuss the implications for regional air quality and climate change.