

5.062 Atmospheric Chemistry: Future Directions.

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Abstract:

Among the key issues with important societal impacts that have been addressed by the atmospheric community in the past decades are questions related to stratospheric ozone, acid deposition, global tropospheric chemistry, biogeochemical cycles. The US National Academy of Sciences has identified several priority areas for the next few years. One of them is to advance the fundamental atmospheric chemistry knowledge that enables predictive capability for the distribution, reactions and lifetime of gases and particles. The Academy calls for better quantitative estimates of emissions and deposition of chemical species in a changing earth system, and for the integration of atmospheric chemistry within weather and climate models. With the more advanced supercomputing facilities, satellites (including geostationary instruments) and small observing devices that can be deployed everywhere, it becomes possible to observe and simulate the global atmosphere at a spatial resolution of just a few kilometers or less. A new direction for our community is to measure, analyze and forecast air pollutants at the city block scale, and to better manage air quality in areas where human exposure is high. Inverse modeling should allow the attribution of pollutant sources which would help the development of mitigation measures.