Single particle measurements of atmospheric aerosol chemistry: Past, present and future

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Single particle analysis allows for an extremely detailed characterization of atmospheric aerosols. Historically, single particle analysis was limited to electron beam techniques or laser desorption-ionization techniques that provided information about inorganic components and limited information about organic components. Presently, it is possible to probe individual particles with a higher degree of spatial chemical resolution. Both laboratory and in situ methods can be used together to gain a more complete view of the state of aerosol in the atmosphere. In the future, advances in instrumentation will bring about ever increasing levels of detail for aerosols and atmospheric processes. This talk will focus mainly on the use of imaging techniques used to understand how aerosols affect climate change. As more complicated models of atmospheric aerosol are developed to include single particle effects, more stringent demands will be placed on the measurement community.