An Introduction to Source Apportionment

Air pollution and particularly particulate pollution from smaller particles ($PM_{2.5}$, particles with aerodynamic diameters $\leq$ 2.5 μm) is now recognized as a major environmental problem resulting in multiple adverse health effects (morbidity and mortality), visibility impairment, ecosystem damage, and climate effects. To adequate manage air quality and reduce the anthropogenic drivers of $PM_{2.5}$, it is necessary to identify and quantitatively apportion the airborne PM mass to its sources. An important approach to doing source apportionments is with *receptor models*. These data analysis tools utilize chemical composition data and utilize the specific patterns of chemical constituents in PM to provide quantitative separation of the mass to the identified sources. In this presentation, the evolution of source apportionment from its beginnings in the 1960s up to current capabilities will be described with illustrative examples.

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Prof. Hopke's research interests are in the areas of multivariate statistical methods for data analysis; characterization of source/receptor relationships for ambient air pollutants; sampling, chemical and physical characterization of airborne particles; experimental studies of homogeneous, heterogeneous, and ion-induced nucleation; indoor air quality; and exposure and risk assessment.

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