

Seminar Series 2014 - 2015

Southern Ontario Centre for Atmospheric Aerosol Research
University of Toronto

Measurement and Modeling of Ultrafine Particles in California



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Ultrafine particles ($D_p < 100\text{nm}$) are ubiquitous in the atmosphere since they are emitted from all sources of combustion. Toxicological studies have consistently found that ultrafine particles are potentially harmful but epidemiological studies have only recently been able to detect associations between ultrafine particles and negative public health effects. Part of the difficulty finding effects in epidemiological studies may be related to the choice of population exposure metrics used in previous studies. In this presentation we will review the different choices for calculating exposure to ultrafine particles (number, surface area, mass) and show that population exposure to $\text{PM}_{0.1}$ (mass of particles with $D_p < 100\text{nm}$) can be estimated through a combination of measurements and model calculations. Results will be reviewed from numerous measurement studies throughout California to infer the apparent toxicity or primary vs. secondary $\text{PM}_{0.1}$ components. Predictions of $\text{PM}_{0.1}$ chemical composition and source contributions will be compared to measurements during field studies spanning a 10 year period. Calculated population exposure to $\text{PM}_{0.1}$ chemical components and sources over this decade will then be used in an epidemiological study to show that associations between mortality and $\text{PM}_{0.1}$ are potentially even stronger than associations between mortality and $\text{PM}_{2.5}$.

December 2, 2015, 3 - 4 pm

Wallberg Building | 200 College Street | Room 407

