**PROPOSAL**

Installation and testing of an aethalometer to evaluate air pollutant emissions from cooking activities

**DURATION**

The project will be carried out in 4 months with 8 hours of work per week expected. The results of the study will be presented on May 1, 2018.

**PROJECT DESCRIPTION**

Black carbon particle emissions have been studied for their known effects on climate and human health. However, “brown carbon” emissions (the brown smoke that can be observed from the incomplete combustion of organic matter) haven’t been studied to the same extent. The potential emissions of black and brown carbon from cooking activities have not been extensively studied and will be investigated in this project.

The initial phase of the project will begin with set up of the aethalometer instrument and training on other laboratory instrumentation (e.g., Nanoscan particle sizer), followed by the study of black carbon and brown carbon emissions from indoor cooking activities.

**LEARNING OBJECTIVES**

* Perform indoor air pollution measurements using AethLabs microAeth® black carbon monitor and TSI Nanoscan particle sizer.
* Investigate the effects of cooking ingredients (e.g., types of cooking oil) on cooking emissions.
* Study the presence/absence of brown carbon smoke in emissions from cooking practices.
* Present at an academic group setting.

**ORGANIZATION**

**January - February:**

* Literature Review (air pollutant emissions from cooking). Identify previous studies, what was measured, main results (create a summary table).
* Start operating the MA200 Aethalometer, read instrument manual and learn to operate it.
* Get trained and start operating the TSI Nanoscan particle sizer.

**February:**

* Develop research methods.
* Start the experimental setup in the laboratory.

**March - April:**

* Perform cooking emission experiments in the laboratory.
* Continue literature review.

**May:**

* Present results at group meeting (30-min presentation) and a report.

**REFERENCE MATERIALS**

**Tang, Rui, and Zhaojun Wang. "Field study on indoor air quality of urban apartments in severe cold region in China." *Atmospheric Pollution Research* (2017).**

**Yu, Kuo-Pin, et al. "Indoor air pollution from gas cooking in five Taiwanese families." *Building and Environment* 93 (2015): 258-266.**

**Nanoscan SMPS Nanoparticle Sizer 3910** *retreived from*[***http://www.tsi.com/nanoscan\_smps\_nanoparticle\_sizer\_3910/***](http://www.tsi.com/nanoscan_smps_nanoparticle_sizer_3910/)

**MicroAeth MA Series Operating manual** *retreived from* [*https://aethlabs.com/sites/all/content/microaeth/maX/MA200%20MA300%20MA350%20Operating%20Manual%20Rev%2001%20Oct%202017.pdf*](https://aethlabs.com/sites/all/content/microaeth/maX/MA200%20MA300%20MA350%20Operating%20Manual%20Rev%2001%20Oct%202017.pdf)

**DELIVERABLES AT END OF PROJECT**

1. Presentation at group meeting (May 1).
2. Final report showing literature review, results (submitted by May 1, with 1 - 3 rounds of reviews performed until the end of the semester).
3. Training session to other students in the Vance Lab on operating the MA200 and downloading its data.