Abstract:
Emissions from motorized vehicles are one of the largest sources of air pollution, and as such they can have considerable effects on environmental and human health. The University of Vermont's Transportation Air Quality (TAQ) Lab uses Fourier transform infrared (FTIR) technology for real-time on-board gaseous emission testing at 1 Hz resolution. The FTIR instrument can be operated with preset calibrations, but verifying the instrument response and developing application-specific calibrations is an important step of research validation. A calibration gas generator (CGG) apparatus has been constructed to facilitate economical calibrations as well as to aid in comparison of results between a MKS HG-2030 Multigas® FTIR and an Autologic 5-Gas Analyzer. The responses of each instrument to a series of steps of decreasing concentration of gas mixture were compared, as well as the response to injection of various hydrocarbons through the CGG apparatus. Results of statistical analysis with JMP statistical software and implications of this research on future FTIR experiments will be discussed.