REMOTE CALORIMETRY FOR FUEL CONSUMPTION OF WILDLAND MATERIALS. ***M. Risi***[1], *A. Bova*[2], *M. Dickinson*[2], *R. Kremens**[1], *mdr5571@cis.rit.edu*, *kremens@cis.rit.edu*.
[1]*Carlson Center for Imaging Science, Laboratory for Imaging Algorithms and Systems,*
[2]*USDA Forest Service, Northeast Research Station, Delaware, OH*

Wildland fires have significant impacts on flora, fauna, soil characteristics, air quality and climate. To characterize these effects, an understanding of overall power and energy release is required, for example, atmospheric emissions are proportional to fuel consumption. Through an understanding of the properties of combustion and radiation transfer, it is possible to indirectly measure fuel consumption. We performed a series of experiments to measure radiated power and energy in controlled burns in Vinton Furnace, Ohio. For each trial, mid-wave and long-wave infrared imagery, carbon monoxide concentration, and relevant fire weather parameters data was collected. Using calibrated thermopile detectors, we were able to model sensor-reaching radiance to effective blackbody temperature. By applying two-color thermometry, we were able to accurately predict actual fire temperatures, radiance and energy release over time. Our results agreed well with conventional measurements of fuel consumption, and we believe our methods may be extended to landscape scale using airborne remote sensing. Results for the 11 experiments will be discussed, as well as possible improvements for subsequent trials.