Emission rates of volcanic SO\textsubscript{2} can be important in the evaluation of the state of activity or unrest of a volcano. Traditional methods for emission rate measurements are hampered by limitations such as uncertain plume velocity and low temporal resolution. Recently developed UV cameras have yielded improvements in both areas. The synoptic views of the plume provided by UV camera allow for investigation of the high degree of variability in plumes and offer the opportunity to measure SO\textsubscript{2} flow rates (as a proxy for volcanic emission rates) anywhere in the image, including at or very near the vent. Plume velocities can be derived from UV camera data time series, eliminating the largest source of error associated with traditional methods. Temporal resolution of the SO\textsubscript{2} dataset is also much improved with sampling frequencies approaching 1 Hz, facilitating comparison to features in other volcanic datasets, such as seismicity and infrasound.

Various models (e.g., bubble coalescence, crack resonance) for low-frequency seismic events and tremor invoke the movement of gas or fluid as the source of such phenomena. To evaluate the relationship between both explosive and non-explosive seismic events and degassing at Fuego volcano, Guatemala, networks of broadband seismometers and infrasonic microphones, and a UV camera were deployed to the volcano in January of 2008 and 2009. Fuego is an open-vent system characterized by persistent, sometimes harmonic, tremor and at the time of measurements experienced, on average, ~2 ash-rich explosions per hour. Early results indicate the presence of both long- and short-term decreases in SO\textsubscript{2} emission rate, from ~1.9 to ~0.15 kg/s over 2 hours, and from ~1.5 to ~0.79 kg/s in less than 2 minutes, respectively, prior to some explosions; increases in emission rate concurrent to non-explosive, low-frequency events; and systematic variations in emission rate that do not appear to correlate with seismic activity. We present the latest improvements to current algorithms for the processing of UV camera data, and preliminary analyses of the complementary datasets with respect to magmatic processes.