

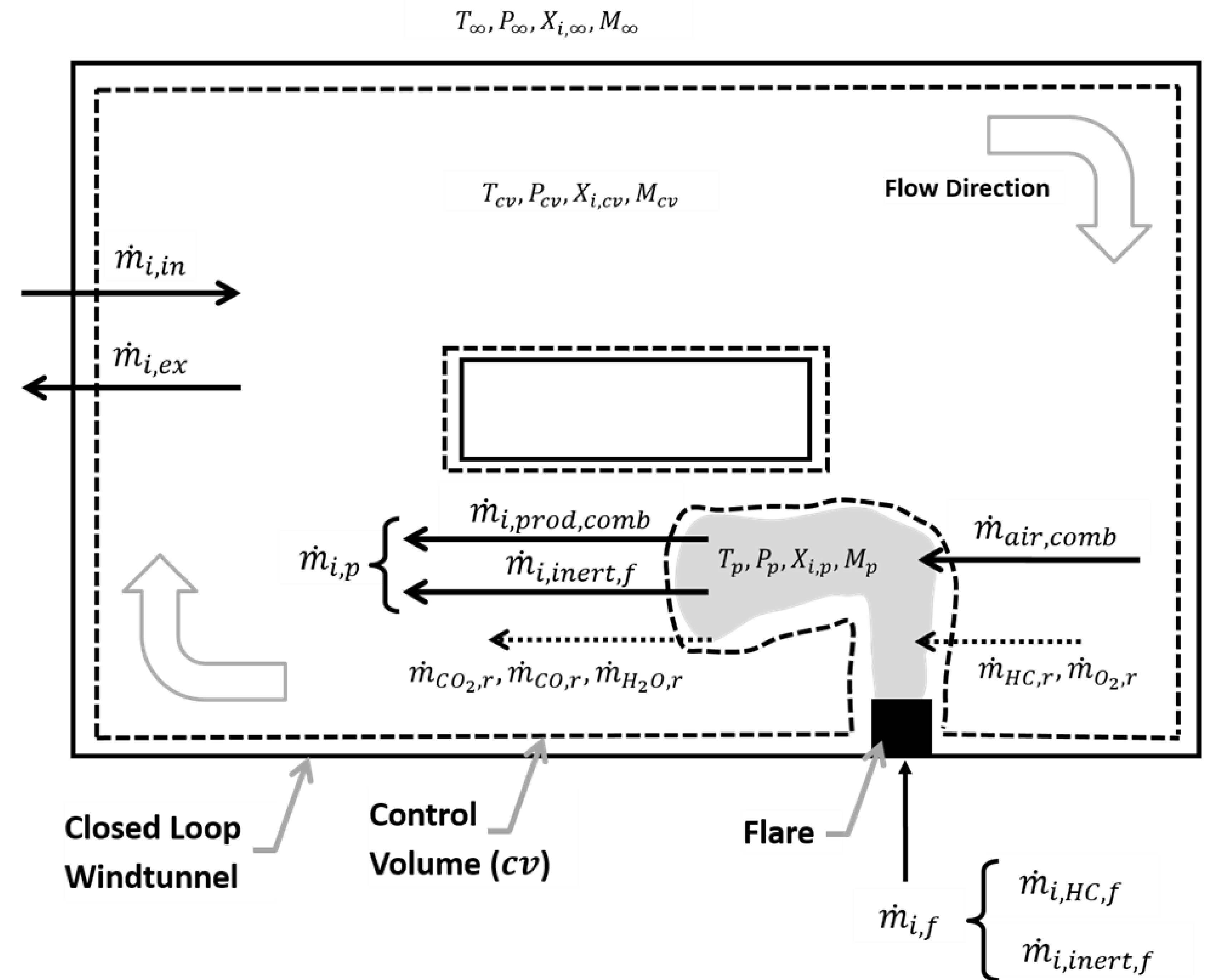


- Flares subjected to crosswinds can undergo fuel stripping mechanisms
- Decreases efficiency
- Leads to emission of unburned fuel

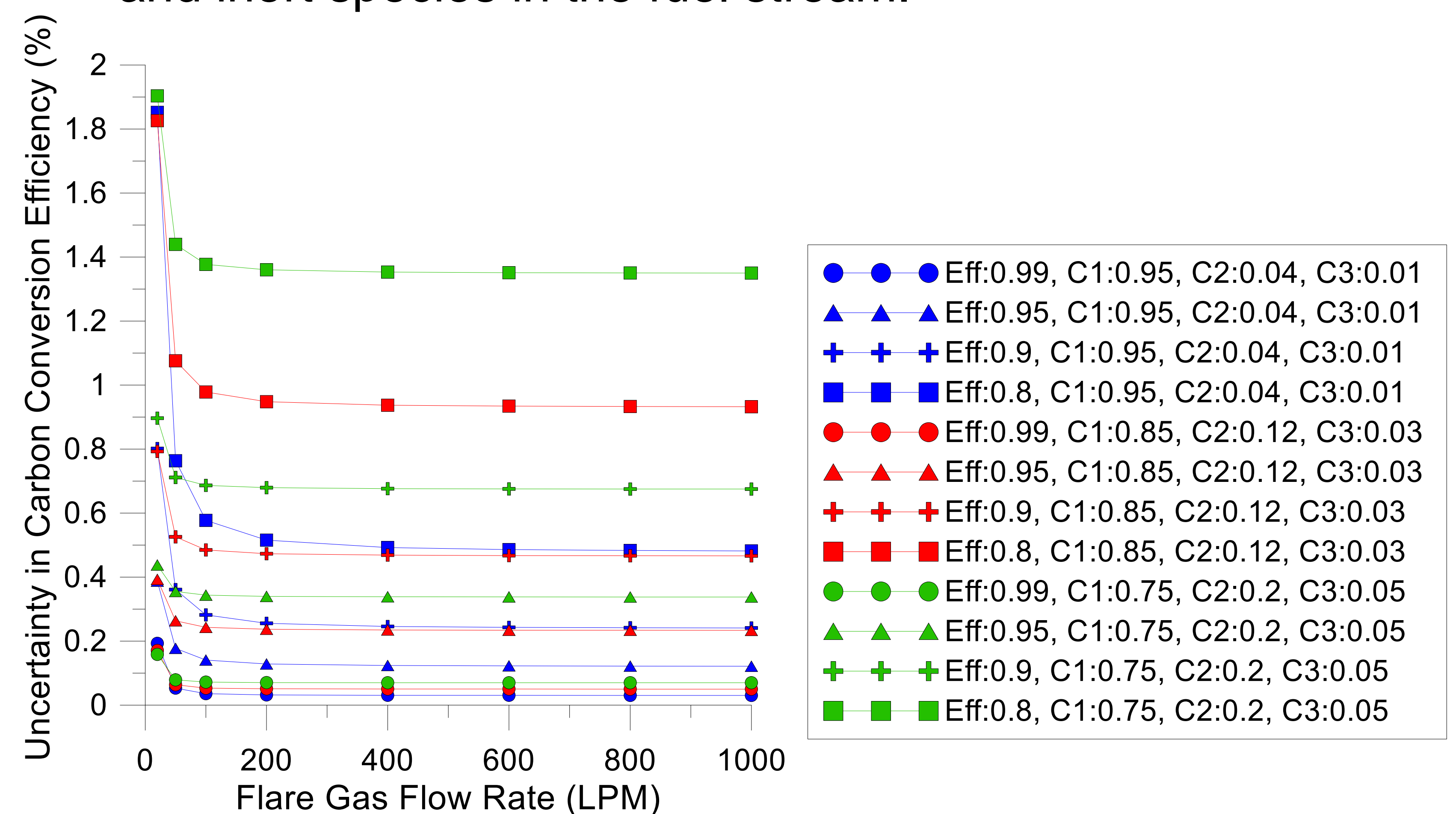
## Systematic Experiments at Western University Boundary Layer Wind Tunnel



- 20 to 1000 LPM flare gas flow rates
- Up to 10 m/s crosswinds of varying turbulence
- Near limitless combinations of flare gas compositions
- Site conditions can be replicated to determine efficiencies and unburned hydrocarbon emission rates



- Methodology based on solving the unsteady mass balance problem to relate accumulation rates of measured species in the wind tunnel to emission rates
- Considers factors such as infiltration/exfiltration, reburning, and inert species in the fuel stream.



Results of an uncertainty analysis performed on the methodology for determining the carbon conversion efficiency of flares in a closed-loop wind tunnel using simulated concentrations. Data presented includes cases with a fuel stripping ratio of 100 % and air exchange rate of 5 ACH.