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Development of single shot 1D-Raman scattering measurements for flames[1] AMELIA BIASE, Smith College, MRUTHUNJAYA UDDI, University of Alabama Tuscaloosa — The majority of energy consumption in the US comes from burning fossil fuels which increases the concentration of carbon dioxide in the atmosphere. The increasing concentration of carbon dioxide in the atmosphere has negative impacts on the environment. One solution to this problem is to study the oxy-combustion process. A pure oxygen stream is used instead of air for combustion. Products contain only carbon dioxide and water. It is easy to separate water from carbon dioxide by condensation and the carbon dioxide can be captured easily. Lower gas volume allows for easier removal of pollutants from the flue gas. The design of a system that studies the oxy-combustion process using advanced laser diagnostic techniques and Raman scattering measurements is presented. The experiments focus on spontaneous Raman scattering. This is one of the few techniques that can provide quantitative measurements of the concentration and temperature of different chemical species in a turbulent flow. The experimental design and process of validating the design to ensure the data is accurate is described. The Raman data collected form an experimental data base that is used for the validation of spontaneous Raman scattering in high pressure environments for the oxy-combustion process.

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