Multitude Characterization and Prediction of DOE Advanced Biofuels Properties
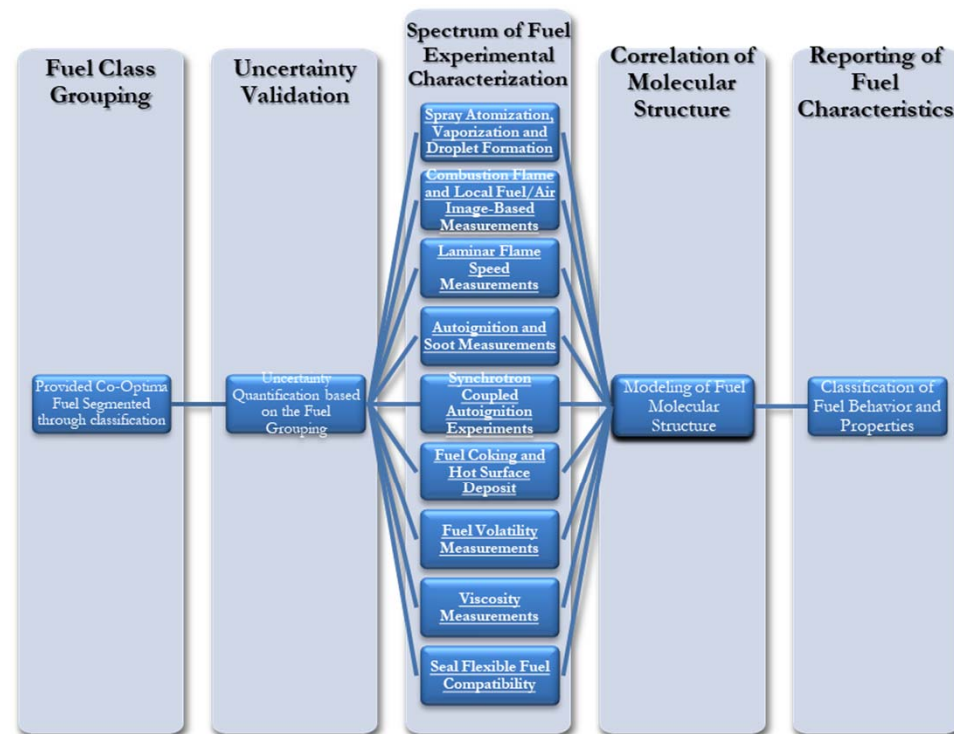
Goals

The goal of this project is to provide a detailed data set of multiple combustion experiments relevant to engine combustion of Co-Optima fuels. The data and information for the fuel behavior will mitigate the potential for combustion operability issues due to the particular fuel being used.

The research project accelerates the introduction of affordable, scalable, and sustainable high performance bio-based fuels for use in high-efficiency, low emission engines thereby achieving the Co-Optima and BETO outcomes.

Approach

The project is focused on providing experimental fuel characterization and property prediction for Co-Optima biofuels and blends. A series of targeted experiments will characterize and predict Co-Optima fuel spray atomization, flame topology, flame speed, soot induction time, volatility, viscosity, soot/coking, and compatibility. Fuels selected and prioritized based on input from national lab members.

Potential Impact on Co-Optima Goals

- Technology developed under this program has significant impact through accelerating the process of screening potential fuels to find the optimal fuel-engine combinations
- The project provides validated fuel characteristics and properties data with quantified uncertainty levels applied to Co-Optima and BETO biofuels
- In addition to physical designs and test data, we provide easy-to-apply performance correlations that will aid designers in the application and operation of the Co-Optima fuels
- The product that will result from this project is data and information for the fuel behavior that mitigates the sensitivity of the alternative fuels enabling sustainable, nationwide production of advanced biofuels that can reduce greenhouse gas emissions

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