

Abstract Submitted  
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**Evaporation and Combustion Characteristics of Multicomponent Fuels**<sup>1</sup> PAVAN GOVINDARAJU, Stanford University, ALESSANDRO STAGNI, Politecnico Di Milano, MATTHIAS IHME, Stanford University — Current generation fuels are mixtures of hundreds of complicated organic compounds and accurate modeling of their combustion characteristics provides fundamental physical insights which also help in the design of efficient combustors. This however requires accurate simulation of both evaporation and combustion processes, which, in case of such fuels, demands an approach based on calculating properties using only the information of functional groups present in the mixture. The presentation will elaborate on the assumptions and the framework utilized for evaporation and chemical mechanisms. We also present a comparison between various fuels used in the aviation industry as test cases while highlighting on their pros and cons. The focus of the talk will however be on the physical aspects captured using 1D simulations, i.e., preferential evaporation of each species, ignition parameters and emissions while justifying the numerical calculations with experimental data at each stage. Further work involving the coupling of flow with evaporation and combustion can be performed and we briefly discuss why a DNS is necessary to characterize the various combustion regimes.

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