Numerical Simulation of Liquid Oxygen Droplet Combustion in Hydrogen in Microgravity

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● The LOX-H2 system is widely used in rocket propulsion due to its high performance
● In rocket applications, the hydrogen typically vaporizes, while the oxygen remains liquid upon injection, thus the problem of the combustion of liquid oxygen droplets in gaseous hydrogen is of fundamental interest

Overview of Flame Geometry

Physical Scenario

Results to Date:

● The EBI-DNS model results in more accurate flame temperatures than earlier versions of OpenFOAM
● The computed flame stand-off distance is comparable to that observed in the experiments
● The calculated heat transfer is approximately 70% of that indicated by the experimental results, suggesting significant radiative heat transfer