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Large Eddy Simulation and PIV Visualization of a Vertical Hydrogen Jet G. PEDRO, F. PENEAU, T.C. WU, P. OSHKAI, N. DJILALI, Institute for Integrated Energy Systems, University of Victoria — Increasing concerns about green house gas emissions and deteriorating local air quality will necessitate substantial emission reductions, particularly from road vehicles. Canada has made important contributions in paving the way for the use of hydrogen in the transportation sector, which could lead to a substantial reduction of urban pollution and CO₂ emissions. However production and storage issues, as well as the absence of specific standards for hydrogen are regarded as obstacles to the introduction of hydrogen in the energy market. A hydrogen jet exiting into quiescent air in both the supersonic and subsonic regimes is simulated using large eddy simulation with a Smagorinski subgrid model. The subsonic results are compared with experimental results obtained by Panchapakesan et al. and So et al. Using a high speed PIV system, a subsonic air-in-air jet is studied and the time averaged flow-field is compared to the one obtained in the simulation.

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