**LES/PDF studies of joint statistics of mixture fraction and progress variable in piloted methane jet flames with inhomogeneous inlet flows** PEI ZHANG, Purdue University, ROBERT BARLOW, Sandia National Laboratories, ASSAAD MASRI, The University of Sydney, HAIFENG WANG, Purdue University — The mixture fraction and progress variable are often used as independent variables for describing turbulent premixed and non-premixed flames. There is a growing interest in using these two variables for describing partially premixed flames. The joint statistical distribution of the mixture fraction and progress variable is of great interest in developing models for partially premixed flames. In this work, we conduct predictive studies of the joint statistics of mixture fraction and progress variable in a series of piloted methane jet flames with inhomogeneous inlet flows. The employed models combine large eddy simulations with the Monte Carlo probability density function (PDF) method. The joint PDFs and marginal PDFs are examined in detail by comparing the model predictions and the measurements. Different presumed shapes of the joint PDFs are also evaluated.

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