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A bivariate beta distribution as a presumed pdf for two mixture fractions ERIC DORAN, HEINZ PITTSCH, Stanford University — In turbulent reacting flows, an assumed pdf of a conserved scalar is often used to characterize the composition of the fluid. If more than a single fuel stream is present multiple mixture fractions are necessary, in which case a representation of the joint statistics is required. Here, several joint distributions proposed in the literature and a new bivariate beta distribution are investigated with regard to their suitability as a presumed pdf for the mixing of two conserved scalars. The bivariate beta distribution has the advantage that the marginal distributions reduce to univariate beta distributions, which have been shown to perform well for the mixing of a single conserved scalar. The presumed distributions are compared to DNS data over a range of initial scalar fields, including variations in the state of mixing and proportions of each scalar.

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