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Particle Pair Dispersion in a Turbulent Premixed Flame RYAN DARRAGH, COLIN TOWERY, PETER HAMLINGTON, University of Colorado, Boulder — Turbulence greatly enhances the mixing of scalar quantities in a wide range of both natural and engineering flows. In flames, mixing can be especially important to understanding the transport of chemical species concentrations and temperature. Here, we study this mixing by considering the dispersion of fluid particle pairs in a turbulent premixed methane-air flame at a Karlovitz number of $Ka \approx 100$. Particle pairs are seeded such that their centroid lies on a temperature isosurface, providing temperature-resolved results and allowing for the study of dispersion as particles travel through the flame. Our results are compared to non-reacting turbulent flows to determine what differences exist between high Karlovitz number flames and non-reacting turbulence. Particular attention is given to recovering Richardson's scaling and determining how the scaling changes through the flame.

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