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A pressure-strain correlation closure model with improved consistency with the Rapid Distortion Theory of Turbulence ANANDA MISHRA, SHARATH GIRIMAJI, Texas A&M University — This work introduces the development of a new pressure-strain correlation model that is consistent with rapid distortion theory in two-dimensional strain and rotation dominated mean flows. Based on a modal (rather than statistical) analysis of the RDT equations and system bifurcation characteristics, small but important changes to the current pressure-strain correlation models are proposed. The closure procedure yields a direct relationship between the model coefficients and the RDT statistical data in the all-important intermediate regime of evolution. The new model coefficients depend on the mean-flow invariants and many of the current models can be recovered as special cases. The predictions of the new model are evaluated in a variety of canonical test cases.

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