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A model for the joint PDF for the scalar difference and the length scale in dissipation element analysis LIPO WANG, NORBERT PETERS, Aachen University — Turbulent flow fields can be subdivided into dissipation elements, which are defined as the regions where trajectories share the same maximal and minimal points of a preset scalar. Among many parameters to describe the statistical properties of dissipation elements, two are of primary interest, namely the linear length, which is the straight line connecting the two extremal points and the scalar difference at the two points, respectively. The joint PDF of these two parameters allows to determine all conditional moments and thereby to provide the anomalous scaling exponents of higher structure functions. The model for the joint PDF is an extension of the model for the length scale distribution functions developed in Wang&Peters, JFM 554, 457-475. The comparison of the results from the model with DNS data shows qualitatively a good agreement.

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