

Determining Turbulent Kinetic Energy Dissipation from Batchelor Curve Fitting

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ABSTRACT

A robust algorithm is presented for obtaining the rate of turbulent kinetic energy dissipation by fitting the theoretical Batchelor spectrum to the temperature gradient spectrum at high wavenumbers. The algorithm is successful in selecting the turbulent Batchelor component from temperature gradient spectra, which have finestructure, internal wave and noise contributions. The theoretical curve is fitted using an error function that takes into account many of the characteristics of the Batchelor spectrum. Overall, the use of the algorithm to determine dissipation of the turbulent kinetic energy, results in considerable time savings when compared to manual methods. The accuracy of the method is also discussed.