

Abstract Submitted
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Biases in Thorpe scale estimates of turbulence dissipation¹ ALBERTO SCOTTI, Dept. of Marine Sciences, UNC-CH — The Thorpe-scale method is widely used to estimate dissipation and mixing rates in environmental stratified turbulent flows from density measurements along vertical profiles. We show that the relevant displacement scale in general is not the rms value of the Thorpe displacement. Rather, the displacement field must be Reynolds decomposed to separate the mean from the turbulent component, and it is the turbulent component that ought to be used to diagnose mixing and dissipation. In shear-driven flows, the rms of the Thorpe displacement, known as the Thorpe scale is shown to be equivalent to the turbulent component of the displacements, and we show that the Thorpe scale approximates the Ozmidov scale, or, which is the same, the Thorpe scale is the appropriate scale to diagnose mixing and dissipation. However, when mixing is driven by the available potential energy of the mean flow (convective-driven mixing), we show that the Thorpe scale is (much) larger than the Ozmidov scale.

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