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Interactive comment on "Turbulent mixing in the seasonally-stratified western Irish Sea: a Thorpe Scale perspective" *by* K. L. Stansfield et al.

Anonymous Referee #2

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In this paper, the authors compare estimates of dissipation from microstructure and Thorpe scales in the stratified shelf seas, where energy input for mixing comes from bed stresses and surface buoyancy fluxes.

The methods are generally standard, but I would like to know why 0.1 m vertical averages of temperature were chosen? (it isn't clear to me from the text) As noted in the paper, when the overturns are on that scale, it isn't surprising that the Thorpe scale method doesn't capture them. Essentially, the method is set up to fail in the thermocline from the beginning.

In the analysis, I would have liked to have seem a more quantitative comparison between the Thorpe scale and microstructure methods. Right now, all we have is a qualitative comparison by eye in Figure 2. It seems that the results could be more ro-

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bustly compared throughout the water column. It would be good to see representative individual profiles from all three methods.

I am also not sure that I find this paper particularly exciting. While the statement "few direct comparisons have been made between Thorpe scale and microstructure shear probe dissipation estimates" may be true of the shelf seas, is not really true overall. Usually such comparisons are embedded within papers that aren't primarily about this (probably because such comparisons aren't really exciting on their own, unless a meta-analysis is being done).

The attempt to illuminate understanding of the broader physical processes seems weak. The microstructure measurements alone could address the question of how dissipation depends on stratification and shear in shelf sea regions where tidal stresses drive the mixing. Given how much microstructure data this group of authors has collected in stratified shelf sea regions, it seems that more than speculation based on 24 hours of data could be given, if this is to be an important point of the paper.

Perhaps a more useful point is that Thorpe scales don't work in this environment. I do think it is important that these kind of results are published (if robust), even though they are not exciting, because it establishes a baseline for when certain methods work and when they don't. If the results that mostly get published are those where Thorpe scales agree, we end up with a very skewed view of the utility of Thorpe scale analyses for estimating turbulence.

Figure 2: It looks like you need to use a different renderer for exporting your figures from Matlab; the blurry images in the bottom panels need to be fixed for this to be publication quality. Also, the letters in the top three panels are not visible - they need to be in black.

Figure 3: The caption is confusing. I know what you mean, but the caption isn't structured well.

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Interactive comment on Ocean Sci. Discuss., 10, 2141, 2013.