



## Abstract View

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# A Modified Inertial Dissipation Method for Estimating Seabed Stresses at Low Reynolds Numbers, with Application to Wave/Current Boundary Layer Measurements

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### ABSTRACT

The inertial dissipation method for estimating seabed friction velocities from near-bed turbulence spectra requires few measurements; it is relatively insensitive to errors in sensor orientation and measurement of mean flows. However, the method is only valid if turbulence spectra are measured at a height above the seabed that is small enough to be within the constant stress layer but large enough to produce an inertial subrange. It is shown that such a height exists only if the friction velocity exceeds a critical value (typically  $0.8 \text{ cm s}^{-1}$  for a midlatitude ocean). Recent measurements from combined wave and mean flow conditions on the continental shelf do not satisfy this requirement. However, an empirical modification to the inertial dissipation method is suggested to allow estimation of the friction velocity even when a true inertial subrange does not exist. The modified method is applied to the combined wave and mean flow field data; it virtually removes an increase in estimated friction velocity with height, and results in values which are in good agreement with theoretical expectation. It generally applicable, the modified method will significantly extend the range of conditions in which the inertial dissipation method can be used.

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