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Comment

Interactive comment on “Effect of variable winds on current structure and Reynolds stresses in a tidal flow: analysis of experimental data in the Eastern English Channel” by K. A. Korotenko et al.

Anonymous Referee #1

Received and published: 17 July 2012

General comments:

This is an excellent study of Reynolds stress, shear and turbulent kinetic energy in a tidal flow in the Eastern English Channel near the northwest coast of France in water of about 20m depth. The data is from a bottom-mounted ADCP with bins from 1.5m above the bottom to the surface and covers 12 diurnal cycles from spring to neap tides and alternating storm and calm periods. Stresses and shears are obtained by a beam variance method and wave biases are removed by a variance fit method. Under storm conditions the stress in the upper layers is mostly wind generated and is enhanced when the southwesterly winds blow against the ebb tide causing increased

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wave-supported stress as well as skin stress. The near bottom stress is insensitive to the wind and shows a quadratic dependence on the tidal velocity with a larger (by a factor of almost 2) drag coefficient in flood than in ebb.

Specific comments:

No explanation is offered for the extraordinary change in drag coefficient depending on tidal flow direction. Could it be that the terrain was rougher to the immediate southwest of the ADCP than it was to the northeast?

Technical corrections:

The abscissae of figure 6 are wrongly labeled: units are (cps) not (cph).

Interactive comment on Ocean Sci. Discuss., 9, 2215, 2012.

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