Ocean Sci. Discuss., 12, C285–C286, 2015
www.ocean-sci-discuss.net/12/C285/2015/

Ocean Science
Discussions
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Interactive comment on "Shifting momentum balance and frictional adjustment observed over the inner-shelf during a storm" *by* M. Grifoll et al.

Anonymous Referee #1

Received and published: 12 June 2015

This paper reports an interesting investigation of the momentum balance over a microtidal inner-shelf during a storm from extensive observational data set including currents, waves and wind.

The hypothesis and laws used to close the momentum equation are carefully presented and justified. The chosen site (including alongshore wind direction) is relevant.

The main interest of this investigation concerns the time series for an unsteady event including two wind peaks and a transient relaxation period. As expected, geostrophic equilibrium is not satisfied in transient condition when non linear effects affect bottom stress and inertial terms. Relevant adjustment times are presented on figure 6.

A first comment is concerned with the use of closure laws well established for steady

conditions but that can be questionable in transient ones (especially time delay and phase shift). This point could be discussed from times series given Figures 3, 4 and 5

From this point of view, accuracy of measurements and closure laws could be pointed out.

Other comments :

Although closure of the momentum equation is used to estimate the PGFR (equation 3) a total budget could be drawn on figure 4 to comment the chosen procedure.

Text is sometimes a bit long and repetitive (p 909, 910).

Minor comments :

verify citations : Shearman <et al> 2005 (p899) is single author in reference list Scott and Csanady <1976> missing year

text : - page 899 line 13 : verify the sentence "prevalent terms ..."

- page 903 line 3 : Fig <3> a and d

- page 908 line 13 : Lentz <et al > 1999

- page 912 : Please take care of number of figures (no figure 5 in the text ?)

Figures :

Fig 1 : add the wave measurement in A3 in the legend

Fig 3 : too small to read scales in printed version

Fig 4 : total budget is missing (sum of the 4 terms)

Interactive comment on Ocean Sci. Discuss., 12, 897, 2015.