

Interactive comment on “A fully coupled Atmosphere–Ocean Wave modeling system (WEW) for the Mediterranean Sea: interactions and sensitivity to the resolved scales and mechanisms” by P. Katsafados et al.

Anonymous Referee #1

Received and published: 18 June 2015

I'm really torn by this paper. I'm all in favor in showing the impact of coupling but I was extremely disappointed that the authors have barely acknowledged that the work they present here has already been done and has been at the core of the operational forecasting system from the European Centre for Medium-range Weather Forecasts (ECMWF) since 1998. Peter Janssen and his team have shown through the years the benefit of such approach. Peter even has a book dedicated to that (Janssen 2004: The Interaction of Ocean Waves and Wind, Cambridge University Press). Moreover, Peter was awarded this year the Nanssen medal in physical oceanography, in greater part

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because of his work on this topic. Even more disappointing is to note that this work was carried out during the MyWave project, in which Peter was also involved in showing that coupling waves to the ocean circulation (on top of the wave-atmosphere coupling) was also beneficial (Oyvind Breivik, Kristian Mogensen, Jean-Raymond Bidlot, Magdalena Alonso Balmaseda, Peter A.E.M. Janssen, 2015: Surface Wave Effects in the NEMO Ocean Model: Forced and Coupled Experiments Journal of Geophysical Research: Oceans 04/2015; DOI:10.1002/2014JC010565)

The description of the method used to couple the wave model to the atmospheric model does not indicate anything really novel with respect to what was done by ECMWF. The model parallelisation is different but the essence is still the same. Moreover, it looks to me that the WAM code used does not contain certain adjustment to the numerical code that was necessary when the original WAM code was adapted at ECMWF (see ECMWF IFS documentation Chapter 7 and Bidlot J.-R. 2012: Present status of wave forecasting at ECMWF. Proceeding from the ECMWF Workshop on Ocean Waves, 25-27 June 2012. ECMWF, Reading, United Kingdom), now called ECWAM. ECWAM contains the same sea state dependent Charnock parameterisation but also the impact of gustiness and air density on wave growth. One might argue that ECMWF focuses on global scale application, whereas this paper interest was the Mediterranean basin. But I will argue that all these effects might actually be more important over the Mediterranean Sea. The paper would have constituted a nice contribution the field, had the authors gone beyond reproducing what had already been done (by ECMWF and others). For instance explore the behavior of the heat and moisture flux on sea state Jassen 1997: Effect of surface gravity waves on the heat flux, ECMWF Technical Memorandum <http://old.ecmwf.int/publications/library/do/references/show?id=83780> or fluxes specification for short fetches and/or under influence of bora like winds,....

Interactive comment on Geosci. Model Dev. Discuss., 8, 4075, 2015.

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