

We thank Prof. Bowers for your comments and suggestions. In general, we find there is something not clearly described and some figures are not well illuminated. We will modify these in our revision.

Comments For example, figure 2 illustrates how the process works: particles are imagined to roll down slopes into the regions of lowest sea level. In figure 2b, however, the particles don't seem to roll straight down hill. Is this just because the 'pixels' are not square?

Reply : After read your comments and suggestions, we think figure 2b should be redrawn especially by following your suggestions on presenting. The target of splitting algorithm is marking each pixel (grid) as part of proper eddies. Noting that each pixel is surrounded by 8 *discrete* neighbors, the paths are only the connections of the nearest pixels with approximation, when the particles roll straight down hill (in continuous field).

Comments Also, I'm not clear what happens at the 'watershed'. A particle placed on a watershed will not roll either way (unless given a nudge, presumably). Is this how the watershed is defined?

Reply : There are two kinds of 'watershed' in nature division (a ridge between basins / a valley between plateaus). A particle placed on a valley will not roll either way (unless along the valley), but a particle placed on a ridge will easily roll down (given a nudge, presumably) to basins (never along the ridge). In this paper, we do not try to find the exact location of the watershed, but only use the property of watershed (ridge): a particle can't roll across the ridge from one basin to another one.

Comments The figures are supplemented by text in the form of a flow diagram. That's potentially good idea but I don't think it works very well in this case. Perhaps MATLAB code would be clearer?

Reply : Our codes are totally written in Fortran and we do not familiar with MATLAB code. We will try to use flow diagram to show the algorithm more clearly.

Comments I therefore suggest that the authors think of a clearer way of presenting their method.

Reply : Thanks, we will follow your suggestions

Comments I would suggest presenting a two-dimensional grid of numbers with one or two eddies present and show how their strategy would proceed, explaining in terms of the numbers in the grid.

Reply : Thanks for this useful suggestion.

Comments page 1721 'reduce the contour of the SLA' doesn't make any sense. Do you mean reduce 'the number of contours'?

Reply : Yes

Comments page 1722 I don't know what you mean by a 'simply connected set of pixels'. This phrase appears again later in your paper.

Reply : 'simply connected set of pixels' is an objective requirement of eddy definition (e.g. Chelton et al, 2011). This condition assumes that all region of any eddy must be connected, which is something like that domain of a country.

Comments page 1724 line 1 in your steps: why do the eddies have to be cyclonic?

Reply : We are sorry for this unclear. The multi-nuclear problem occurs only when the close eddies have seem polarity (all in cyclonic or all in anti-cyclonic), because the cyclonic eddies can be easily identified from anti-cyclonic ones. We only take cyclonic eddies as examples. If the eddies are anti-cyclonic, the only different is that “fast descent” has to change to “fast ascent”, because the extremes are local maximums and the watershed is a valley now.

Comments figure 1 I'm afraid I don't understand this diagram and I don't see how it adds anything that is not covered by figure 2(b). You don't label you axes. I think you should.

Reply : We are sorry for the unclear. Your suggestion about axes is useful, we will modify it accordingly. The main point of Figure 1 is that if we don't use splitting method (Fig 1a), the identified eddies will be unexpectedly smaller and weaker than these in Fig 1b (these occurred in previous studies as mentioned in page 2, paragraph 2). However, we tried to explain how this splitting method works in Fig 2b. We are sorry for that the figure 2 is not as clear as we thought. But your above suggestion for presenting will sure be helpful.