

## ***Interactive comment on ““Scale oriented” embedded modeling of the North-Western Mediterranean in the frame of MFSTEP” by C. Estournel et al.***

### **Anonymous Referee #2**

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This paper presents important work to the community, and should be published, following minor revision to make the presentation more effective. My suggestions are:

Primary issues:

- "scale oriented" is never really defined, until perhaps the middle paragraph of page 170. It should be defined in the Introduction.
- Page 150/151: "As in most coastal models, a sigma coordinate system provides a realistic representation of the bathymetry". I'm not sure exactly what was meant here. Sigma coordinate models require a certain amount of smoothing of bathymetry to avoid

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pathologies associated with a steep bottom, and this smoothing makes for a somewhat unrealistic bathymetry. Isn't the advantage of sigma coordinates for coastal modeling more in the enhanced resolution of shallow near-coastal flow?

How much smoothing is applied to the bathymetry?

- Page 154/155: I would prefer to see the description of Surface Conditions summarized here, with details moved to an appendix.
- Page 161: why is temperature "poorly affected by river discharges"?
- "Figure 5 clearly shows that 60 to 65% of the discrepancies between forecasts and observations are associated to a negative bias". Is this really obvious from figure 5 (I don't see it, but it's possible that I've missed the obvious)?

More minor issues:

- a number of places, in "in details" is used; should be "in detail".
- acronyms should be introduced (POM, POC, etc.).
- In a number of places (but not all), "associated to" should be "attributed to" (in other places, it should be "associated with").
- A number of the figures have type (axis labels, etc.) that are too small to be legible.
- The velocity vectors on several plots are also too small.
- page 146 line 24: "It also comes in the continuity and...". I think what it intended is "It also provides continuity and...".
- Page 150 line 24: "the latter is ...". What was the former?
- Page 150 line 27: isn't the centered advection scheme second order?
- Section 2.4: Is the coastal model grid a subdivision of the regional model grid? Are the two bathymetries closely related?

- Page 158: "In one hand" should be "On the one hand", or perhaps just "First, ".
- Page 158: I'm not clear what is meant by "previsibility".
- Page 158: It is stated that the model "is forced at its free surface by analyzed atmospheric fluxes, along its open boundaries by GCM analysis", but then the hindcast is described as driven only by "analyses...for atmospheric, oceanic and river forcing". I assume this means the GCM component of forcing is dropped, although it was just referred to as an analysis? This point should be clarified.
- Page 160, last paragraph: "Biases being relatively small..." should be qualified as "Biases in global mean measures being relatively small..."
- Page 161: "In order to study the relevance of the 5-day forecast strategy...". Do you mean the "effectiveness" of the strategy?
- page 163: "for a large part" should be "in large part".
- Page 165, first complete paragraph: the final sentence needs to be revised.
- Page 165: "less saltier" should be "less saline".
- Page 165: "north-western wind" should be "northwesterly wind".
- Page 166: what is meant by "canalized... winds"?
- Page 166: "These winds have a strong influence on the Northern current at the eastern entrance of the Gulf of Lion. The influence of the northern winds on the Northern Current is yet poorly known." Perhaps it would be more clear to say: "These winds have a strong influence on the Northern current at the eastern entrance of the Gulf of Lion, the details of which remain poorly understood."
- Page 165: "responsible of" should be "responsible for".
- Figure 3: the caption could refer back to Eqns 11, 12.

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