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Ocean Science Discussions

Interactive comment on "DINEOF reconstruction of clouded images including error maps. Application to the Sea-Surface Temperature around Corsican Island" *by* J.-M. Beckers et al.

J.-M. Beckers et al.

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Dear Michel, Thank you for your suggestions. We will try to incorporate your comments as follows into the revised version of the paper:

The paper is well written but some of the maths could be moved to a dedicated appendix to facilitate the reading, whilst keeping only the relevant equations useful in the calculation in the body. A more technical paragraph summarizing the different steps and 'equations' used might be very helpful.

Response: The paper aims at demonstrating how error calculations can be added to an analysis method. Therefore mathematics are necessary and we have to find the right level of complexity ensuring the reader can understand and implement the

method. We will relegate the square root calculation (35) to (37) into the appendix as well the asymptotic expansions (39) to (49) (for large and small S/N ratio), only referring to it as showing the importance of the factor $\mu^2 N/(m_p \sigma^2)$ in the error fields.

There are several assumption made in the text, and it is not clear to what extent they are valid in the application presented. A proper validation of the method with one of the following: - in-situ data - co-registered remote-sensing data (e.g. MODIS or MERIS) - cross-validation with some of the same AVHRR daily composites would definitively increase the value of the paper.

Response Currently we are looking into additional data available for validation. As you know, we validated the DINEOF method itself already thoroughly in Alvera et al 2005 and we do not think it is the place to do it again here. In the present case we are focussing on the error fields. Therefore we will have to find a way to check whether the actual errors are coherent with error maps of OI (and DINEOF). This is a validation very difficult to obtain in the sense that it needs a large amount of independent data to compare the error distributions. We probably have to resort to an artificial clouding with verification of the error fields to validate the method.

As it stands, the description in paragraph 760 (759) "The OI reconstruction (Fig. 7) ..." is rather poor and qualitative (cf. '..a more realistic SST distribution...), but no statistics are derived.

Response: The objective was to show that OI with isotropic correlation functions is not appropriate in the region of interest. Even without any statistics, the example shows such strong artefacts that we do not consider it necessary to add quantifications.

In the conclusions, some sort of comparison (algebraic expressions and/or actual values) of CPU time between both DINEOF and OI methods might also be helpful

Response: Again, this was done in Alvera et al 2005 for the analysis itself. For the error calculations, since we use OI for deriving error fields, we could only compare

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it to OI with non-factorized covariance matrices as found in standard applications of OI. In our opinion this brings no new information other than that the cost will increase dramatically: N^3 replaced by m_p^3.

Interactive comment on Ocean Sci. Discuss., 3, 735, 2006.

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