



## **Optimisation of sea surface current retrieval using a maximum cross correlation technique on modelled sea surface temperature**

Céline Heuzé (1), Leif Eriksson (2), and Gisela Carvajal (2)

(1) Department of Marine Sciences, University of Gothenburg, Gothenburg, Sweden (celine.heuze@gu.se), (2) Department of Earth and Space Sciences, Chalmers University of Technology, Gothenburg, Sweden

Using sea surface temperature from satellite images to retrieve sea surface currents is not a new idea, but so far its operational near-real time implementation has not been possible. Validation studies are too region-specific or uncertain, due to the errors induced by the images themselves. Moreover, the sensitivity of the most common retrieval method, the maximum cross correlation, to the three parameters that have to be set is unknown. Using model outputs instead of satellite images, biases induced by this method are assessed here, for four different seas of Western Europe, and the best of nine settings and eight temporal resolutions are determined. For all regions, tracking a small 5 km pattern from the first image over a large 30 km region around its original location on a second image, separated from the first image by 6 to 9 hours returned the most accurate results. Moreover, for all regions, the problem is not inaccurate results but missing results, where the velocity is too low to be picked by the retrieval. The results are consistent both with limitations caused by ocean surface current dynamics and with the available satellite technology, indicating that automated sea surface current retrieval from sea surface temperature images is feasible now, for search and rescue operations, pollution confinement or even for more energy efficient and comfortable ship navigation.