



Distributions of carbonate system properties in the central Mediterranean Sea, from the North to the South, during SESAME 2008 cruises (2008)

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The amount of high quality measurements of the carbonate system properties through the whole Mediterranean Sea is so scarce that was almost impossible to have any precise idea of their distribution until very recently (Yilmaz et al., 36th CIEMS Workshop Monographs 2008). Actually, only in the last decade oceanographic campaigns including such parameters have been carried out (2001-2011) and provided long west-east section through the Mediterranean basin (Touratier & Goyet, 2011; Schneider et al., 2010) pointing out west-east gradients.

For what concerns the latitudinal variability of carbonate system (from the North to the South) in the central Mediterranean Sea (Adriatic and Ionian basins, it is even more poorly known although the occurrence of key processes as ocean acidification, river runoff, dense water formation and high primary production, especially in the Adriatic basin, can produce latitudinal gradients.

The main results of two cruises (in 2008) along the Adriatic and the Ionian basins are presented. Two key properties (pHT and AT) have been measured and the derived carbonate system properties (TCO_2 , fCO_2 , CO_3^{2-} , HCO_3^- , $\delta^{13}\text{C}$, $\delta^{18}\text{O}$) calculated. The main objectives of this poster are (1) to draw and comment on their distributions (pHT in particular) in the light of other properties like salinity, temperature and dissolved oxygen, (2) relate them to the major driving processes and (3) compare surface waters properties (the average in situ values of pHT, TCO_2 , CO_3^{2-} , $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) to those of other oceanic regions (Feely et al., 2009).

Concerning 1st objective, Adriatic Dense Waters have been observed in winter and their carbonate system properties have been characterized. Concerning 2nd one, both thermal and biological controls are driving the inorganic carbon chemistry. Regarding 3rd one, the comparison between surface waters in the central Mediterranean and other oceanic regions points out that central Med contains the highest amount of dissolved inorganic carbon ($2340.1 \pm 38.0 \mu\text{M/Kg}$) with low carbonate ion concentration ($218.0 \pm 9.0 \mu\text{M/Kg}$), in particular at North (in the Adriatic Sea) in winter (when biological activity is absent and river runoff is low and confined to the western slope). This suggests that Mediterranean Sea is really one of the most impacted by OA and indicates that the region is an important place where studying the marine inorganic carbon system and its response to climate change and OA, as CO_2 fluxes are potentially high (being surrounded by industrialized regions) and renewal of water masses is faster than in oceanic regions.