**A NEW CARBON-BASED ALGAL BIOMASS PROXY FOR PHOTOACCLIMATION ANALYSIS IN THE MEDITERRANEAN SEA THROUGH OCEAN COLOR DATA**

M. Bellacicco1,2, G. Volpe1, S. Colella1, J. Pitarch1 and R. Santoleri1

1Istituto di Scienze dell’Atmosfera e del Clima (ISAC)-CNR, Via Fosso del Cavaliere 100, 00133 Rome, Italy

2Università degli Studi di Napoli “Parthenope”, Via Amm. F. Acton 38, 80133 Naples, Italy

Photoacclimation changes the intracellular chlorophyll-*a* concentration (*Chl*), and is not currently taken into account by standard ocean color algorithms. *Chl* production is a process enhanced under high nutrient and low light conditions (e.g. winter and spring in the Mediterranean Sea). Historically, *Chl* has been used as a proxy for marine algal biomass but cannot distinguish intracellular and community variations. Here, a Mediterranean Sea specific model (*Mm*) is described, which makes use of SeaWiFS ocean colour imagery of 1998-2007, to analyze the effect of photoacclimation on the phytoplankton seasonal cycle. The *Mm* model is based on the work of Behrenfeld et al. (2005). The model produces a new carbon-based proxy, named *C*, derived from the particulate backscattering coefficient, *bbp* (λ), to describe the phytoplankton seasonal cycle, particularly for the Mediterranean Sea, where photoacclimation was shown to be of great impact on cellular processes. Results show the *Chl:C* ratio to temporally vary by a factor of 3 to 8, clearly highlighting the dominance of photoacclimation at seasonal and basin scales. Minimum *Chl:C* ratio values are observed during summer, when photo-inhibition is the dominant intracellular process, while maxima are observed in winter and spring when photoacclimation is the most important process. In the productive seasons, proxy *C* is high, while *Chl* drops quickly in response to light increase and nutrient availability. We suggest that the combined use of *C* and *Chl* is strongly needed for a better comprehension of the phytoplankton variability.