**Deriving diel changes of the backscattering coefficient of oceanic particulate matter from diel changes in apparent optical properties: a case study in the Mediterranean Sea (BOUSSOLE site).**

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Ocean color sensors placed on low-Earth-orbits enable quasi-daily measurements of ocean water properties. However the typical “every other day” sampling of these satellites (under cloud-free conditions) is a serious limitation when aiming at rapidly changing oceanic phenomena, such as biogeochemical processes occurring at hourly scale (e.g., phytoplankton photosynthesis). New opportunities is now becoming available from ocean color sensor on geostationary satellites. Such sensors can record the ocean reflectance hourly throughout the course of a day and be used as a tool for extracting information on the diel changes of the particulate backscattering coefficient, bbp, and used it as a proxy net community production. However, it requires that existing inversion algorithms are capable of retrieving bbp under the changing observation conditions encountered during a day. In this study, we show that the bbp diel cycle observed *in situ* is large enough to generate a measurable diel variability in reflectance. Significant differences have been observed between the bbp values retrieved from radiometric quantities and those obtained from the *in situ* measurements, questioning the performance of the inversion algorithm and their applicability to derive the bbp diel cycle from radiometric measurements taken at different time of a day. We found that inversion algorithm might still be not applicable to derive bbp at several time of a day due to their link on bio-optical relationships established from global database. The inversion of radiometric measurements in view of deriving the bbp diel variability is therefore challenged.