

Interactive comment on “In situ determination of the remote sensing reflectance: an inter-comparison” by G. Zibordi et al.

Anonymous Referee #2

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General comments:

The paper presents results of extensive inter-comparison of spectral water-leaving radiance, above-water downward irradiance and remote sensing reflectance, derived from independent in situ methods. The study is addressed to wide group of ocean color data producers and users and corresponds well with current needs in the field. It is distinguished by the wide scale of analyzed methods and detailed accuracy analysis in accordance with the highest standards and best practices.

The objective of the research study was to quantify differences among fundamental radiometric products derived from the application of various above and in-water instruments and methods. It was successfully achieved. Detailed analysis presented in the paper will increase the awareness of the accuracy of satellite ocean color data

C225

validated with in situ data coming from different sources. It is addressed directly and indirectly to many branches of ocean sciences. Currently used instrumentation for remote sensing reflectance reference measurements differs in the design, performances, measurement, processing, and calibration methods. The study provides tools to compare radiometric data from different systems and methods and to enable the user to apply/choose the most suitable data, especially for coastal areas.

General structure of the paper is correct and clear. Relevant composition allows average readers understand the results omitting detailed sections and, on the other hand, it contains specific information for more demanding readers. It consists of six well composed sections. It starts with a brief introduction explaining and motivating the idea of the study. Then some necessary information is given regarding organization of the inter-comparison and inter-calibration of applied methods and sensors. It is followed by an overview on above- and in-water systems and continued with detailed information on each one, which could be of a great significance for specific users. Then results are presented, discussed and summarized with relevant conclusions.

Specific comments:

To improve the quality of presented paper I would suggest attaching the list of symbols to facilitate the reading. That will also help reading off the tables.

Page 791, line 5: As a reader I would like to know which method and why do you consider as a reference at the beginning of the paper. Please indicate the method here or at least give information about criteria of choice of the reference method. The information can be then repeated and completed on page 810, line 10.

Page 793, line 11: The explanation of particular diffuse attenuation coefficients: $K_l(\lambda)$, $K_u(\lambda)$ and $K_d(\lambda)$ is needed here.

Page 793, line 24: θ_0 should be explained here (by the first mention) as the sun zenith instead of on the page 795, line 5.

C226

Page 794, equation 5: $L_w(\theta, \Phi, \lambda)$ should be supposedly replaced by $L_w(\theta, \Delta\Phi, \lambda)$.

Page 798, line 24: Why do you assume $a(\lambda) = K_d(\lambda)$? Please give a prove that scattering coefficient can be neglected in the AAOT waters. Section 2 could be supplemented by brief seawater optical properties characterization at the AAOT.

Page 798, equation 6: The capital letter “Z0” should be supposedly replaced by a small letter “z0”.

Page 798, line 12: Why can you assume that $K_l(\lambda) = K_d(\lambda)$? Please give a short explanation or a reference.

Page 800, line 6: Please explain why do you compute self-shading uncertainties as different percentage for different methods (i.e. 25% for WiSPER, 35% for TACCS, again 25% for TRIOS) or give a reference.

Page 803, line 25: The symbol $L_{wn}(\lambda)$ should be explained just before or just after using it. I suggest to move the expression “the normalized water-leaving radiance” from page 804, line 1 to page 803, line 25 and putting the sign “-“ in correct place. Also the equation $L_{wn}(\lambda) = R_{rs}(\lambda) E_0(\lambda)$ would be more legible when keeping in one line. Page 813, line 17: Pleas keep the previous order of notation $L_w(\theta, \Delta\Phi, \lambda)$ instead of $L_w(\lambda, \theta, \Delta\Phi)$.

Technical corrections:

Please unify the notation of equation citations in the text body: page 795, line 9 gives “Eq. 3”, page 798, line 5 gives “equation 1”, page 807, line 4 gives “Eq. (5)”. There are commas or dots after equations in some sections and in some not, please order that.

Page 803, line 9: “of” is missing after “because”.

Page 813, line 26: Put “TRIOS-B” instead of “TRIO-B”.

Interactive comment on Ocean Sci. Discuss., 9, 787, 2012.