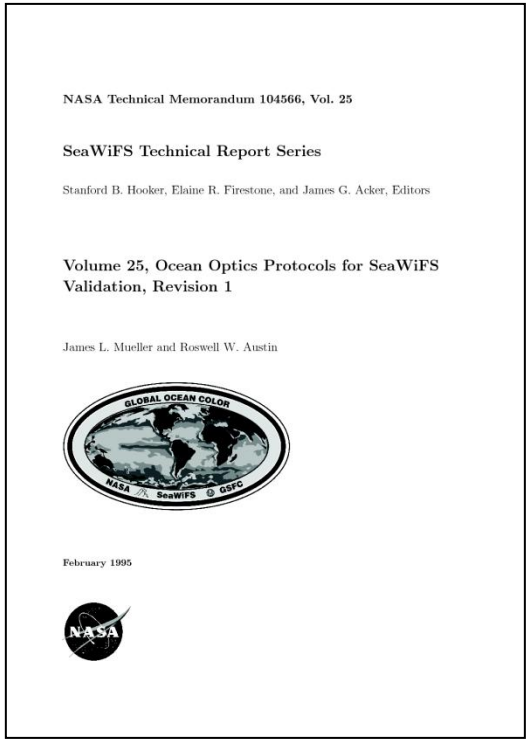
Apparent Optical Properties: Current Status

The **Ocean Optics Protocols for Satellite Ocean Color Validation** (2004) edited by J.L. Mueller, G.S. Fargion and C.R. McClain (5th revision of the original ***Ocean Optics Protocols for SeaWiFS Validation*** by J.L Mueller and R.W. Austin (1992)) is the most comprehensive compilation of AOP Measurement Protocols.



NASA Technical Memorandum 104566, Vol. 25

SeaWiFS Technical Report Series

Stanford B. Hooker, Elaine R. Firestone, and James G. Acker, Editors

Volume 25, Ocean Optics Protocols for SeaWiFS Validation, Revision 1

James L. Mueller and Roswell W. Austin

February 1995

It is so comprehensive that sometimes scientists do not feel the need to provide details on their instruments, methods, uncertainties (e.g., "… ***AOP measurements were performed in agreement with the Ocean Optics Protocols****" as stated in a recent manuscript)).*

Apparent Optical Properties: Improvement Areas

(Just) **Examples**

Above-water radiometry:

- ***Sky- and sun-glint removal (improved through data filtering and advances in measurements);***
  (e.g., Zibordi et al. 2009, Aas 2010, Lee et al, 2013)
- ***Minimization of polarization effects (formally neglected).***
  (e.g., Santer et al. 2012, Harmel et al. 2013)

In water radiometry:

- ***Measurements per unit depth (including fixed and variable acquisition rates);***
  (e.g., Zaneveld et al. 2002, Zibordi et al. 2004, D'Alimonte et al. 2010, Hooker et al. 2013)
- ***Extrapolation of subsurface values (appropriateness of current schemes);***
  (e.g., D'Alimonte et al. 2013)
- **Reduction of data from advanced platforms (e.g., gliders, …).**
  (e.g., Brown et al. 2004)

General:

- ***(Efficient) Minimization of bidirectional effects in optically complex waters ;***
  (e.g., Lee et al. 2012)
- ***Quantification of spatial/temporal variability (to support validation processes).***
  (e.g., Brown et al. 2004)

Apparent Optical Properties: Strategies

- **Standardization of:**
  - ***Calibrations and measurements;***
    (e.g., AERONET-Ocean Color)
  - ***Processing and quality assurance;***
    (e.g., AERONET-Ocean Color, SeaBASS, MERMAID)
  - ***Quantification of uncertainties in in situ data products;***
    (e.g., AERONET-Ocean Color)

Standardization is a step forward in the delivery of quality assured data for calibration and validation, but ***endorsing standardization should not mean diminishing efforts in advancing methods****.*

- **Inter-comparisons of:**
  - ***Calibration and measurement methods;***
    (e.g., SIRREX, ARC)
  - ***Processing and quality assurance codes;***
    (e.g., DARR)

Inter-comparisons are a powerful solution to: ***achieve community consensus, spread know-how, verify implementations****.*

Apparent Optical Properties: Actions

- **Need for revising current Ocean Optics Protocols;**
  *(e.g., accounting for **consolidated findings** in recent peer-review publications)*

- **Publication of protocols using modern communication methods;**
  *(e.g., the INSITU OCR White Paper (2012) suggests to apply a "**Wiki format** accessible and modifiable through continuous community contributions and discussions, but envisaging mechanisms for tracking successive versions")*

Thanks