



EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

Deployment requirements for AERONET-OC instruments

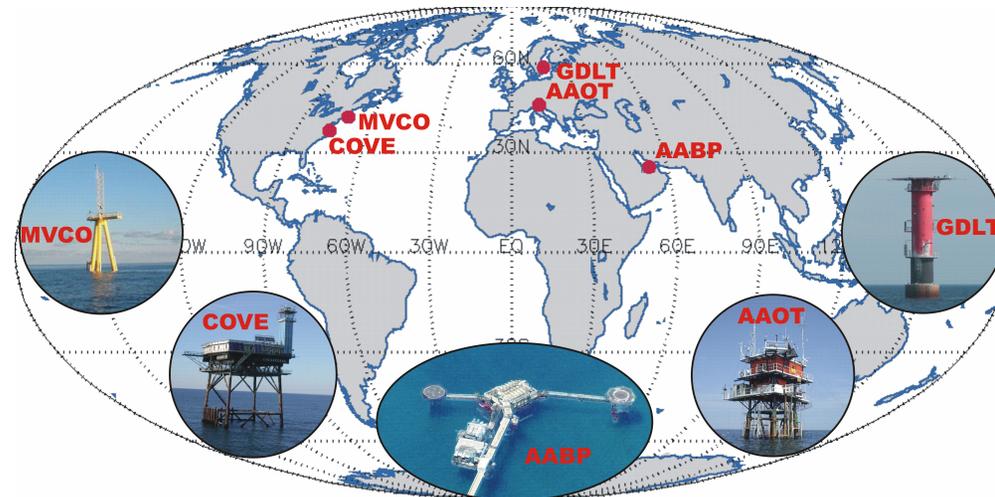
AERONET-OC Workshop, Greenbelt 23-24/02/2011

Compiled by Giuseppe Zibordi



Deployment Requirements

- Fixed deployment platforms to allow for accurate pointing
- Relatively deep waters to minimize bottom perturbations
- Deployment configurations minimizing superstructure perturbations
- Away from land to minimize adjacency effects in remote sensing data

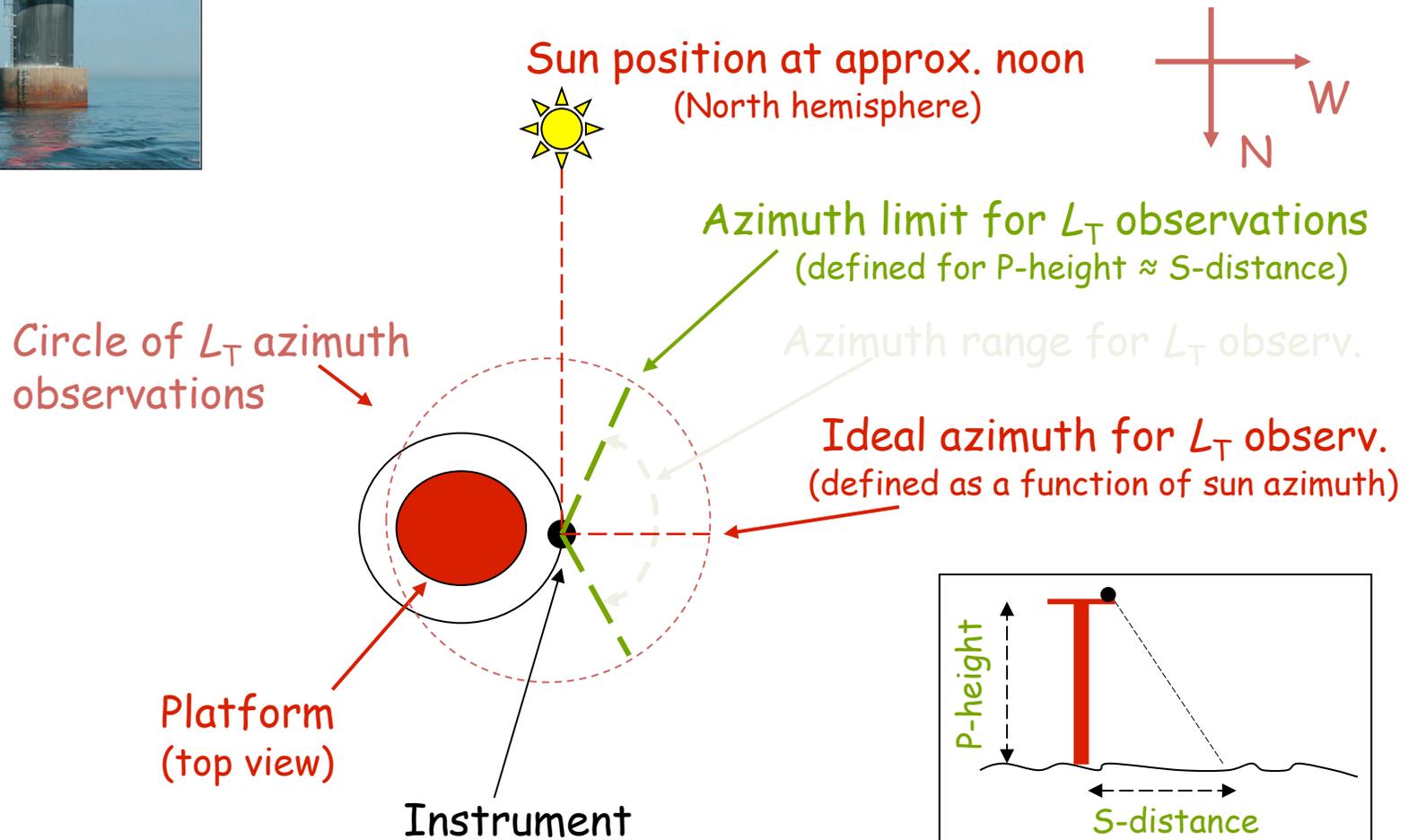


G.Zibordi, B.Holben, I.Slutsker, D.Giles, D.D'Alimonte, F.Mélin, J.-F. Berthon, D. Vandemark, H.Feng, G.Schuster, B.Fabbri, S.Kaitala, J.Seppälä. AERONET-OC: a network for the validation of Ocean Color primary radiometric products. *Journal of Atmospheric and Oceanic Technology*, 26, 1634-1651, 2009.

Deployment platform

(Deployment Requirements +1)

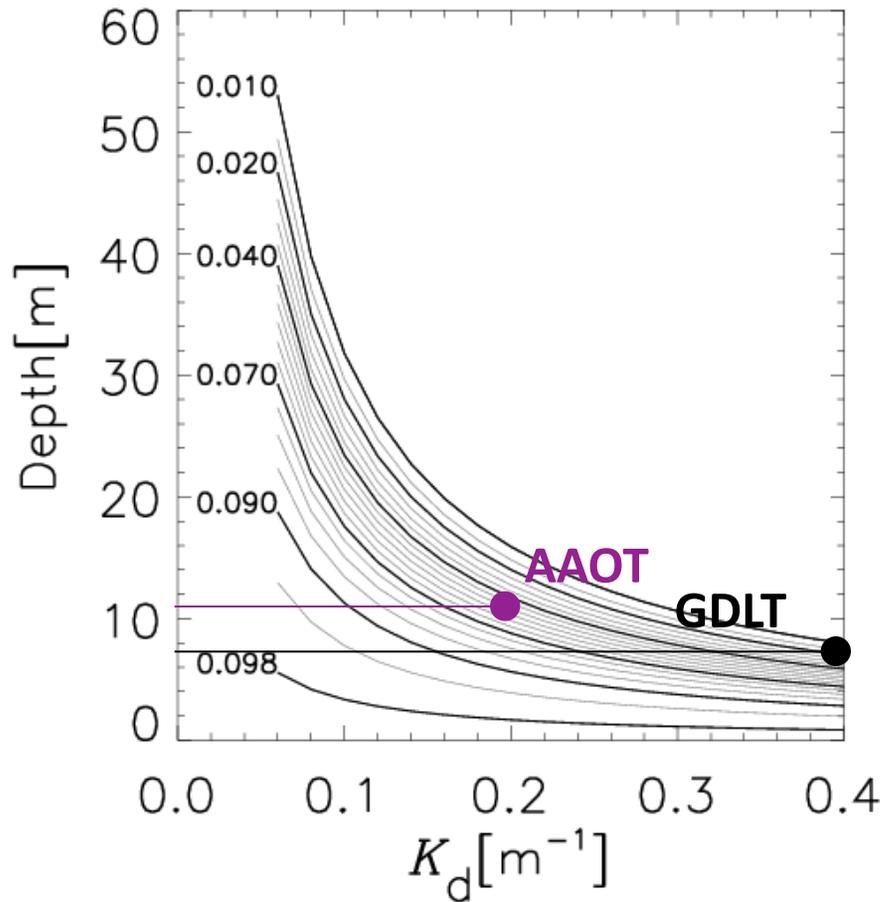
Any fixed structure allowing for un-obstructed sky and sea viewing observations in addition to accurate sun pointing.





Bottom Effects

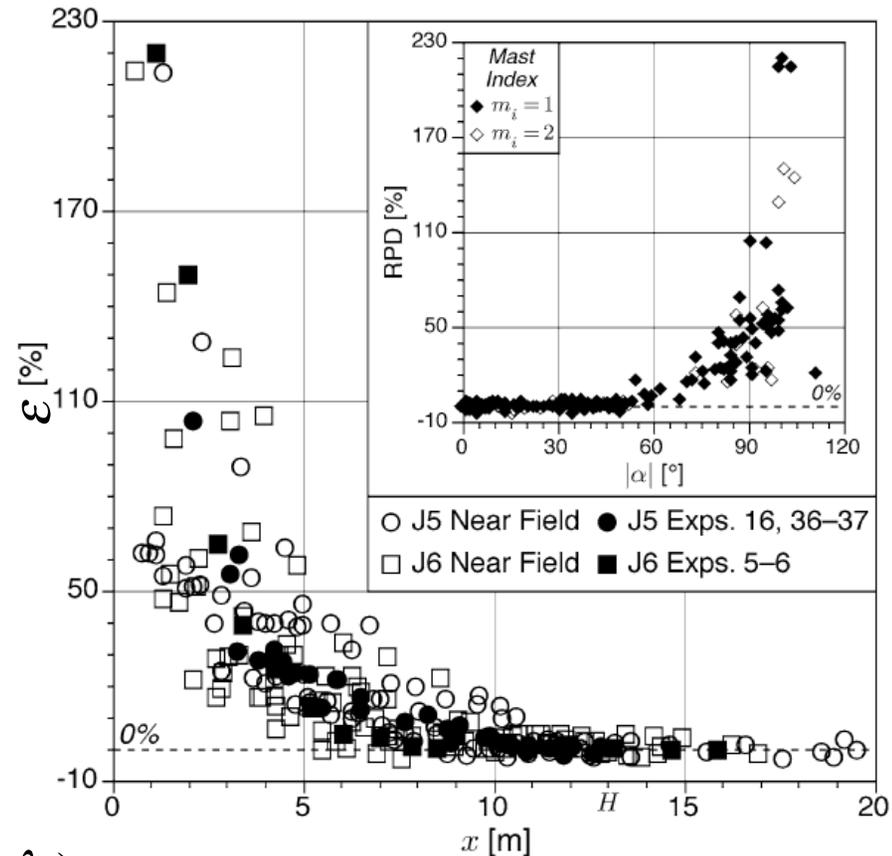
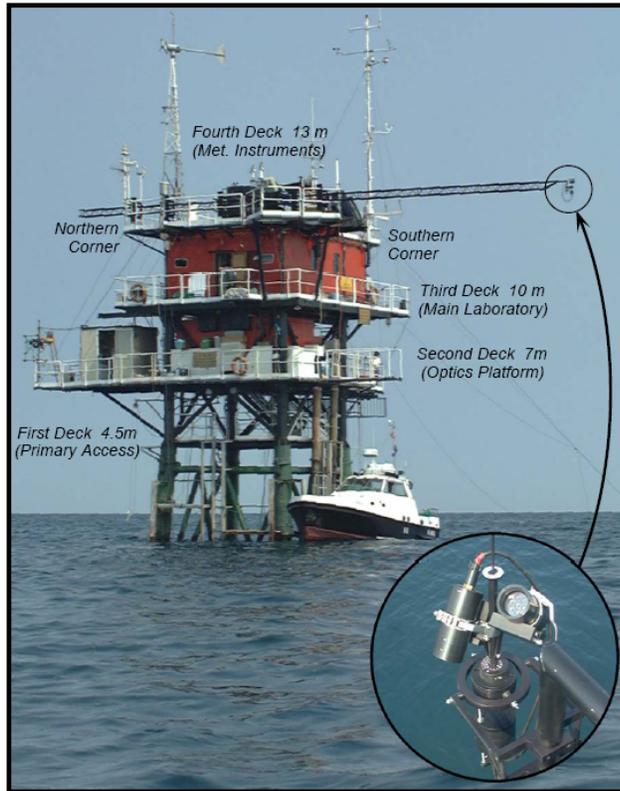
(Deployment Requirements +2)



Water depth at which the bottom perturbation adds a contribution of 1% to the AERONET-OC L_{WN} as a function of seawater diffuse attenuation coefficient K_d and irradiance reflectance R (the latter values are defined by the curves in black) assuming a Lambertian seabed irradiance reflectance $R_B=0.10$).



Superstructure Perturbations (Deployment Requirements +3)



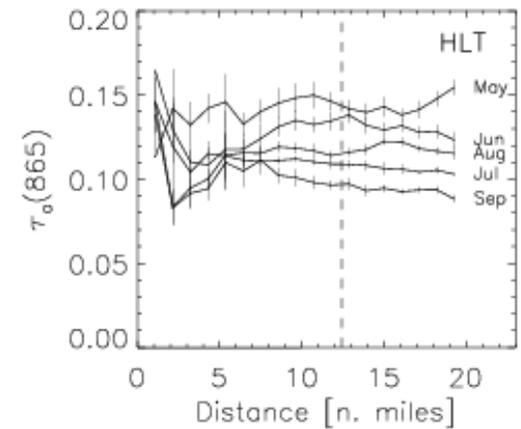
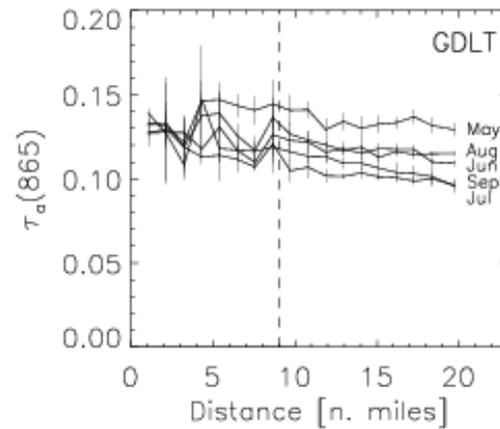
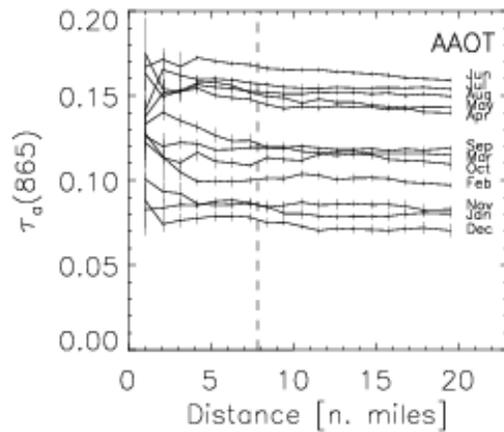
$$\varepsilon(x, x_0, \lambda_0) = 100 \frac{\rho(x, \lambda_0) - \rho(x_0, \lambda_0)}{\rho(x_0, \lambda_0)} \quad \text{where} \quad \rho(x, \lambda_0) = L_T(x, \lambda_0) / L_i(\lambda_0)$$

The observed surface area should be at a distance from the main superstructure larger than the height of the superstructure itself.

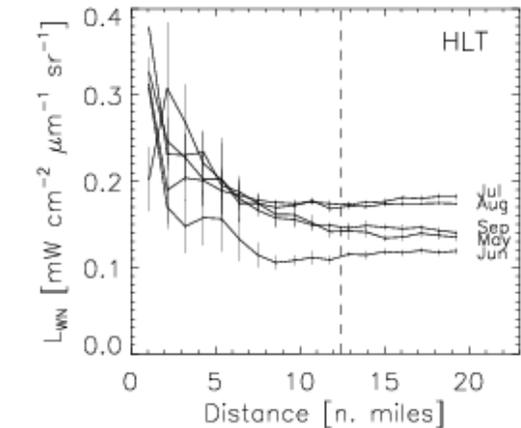
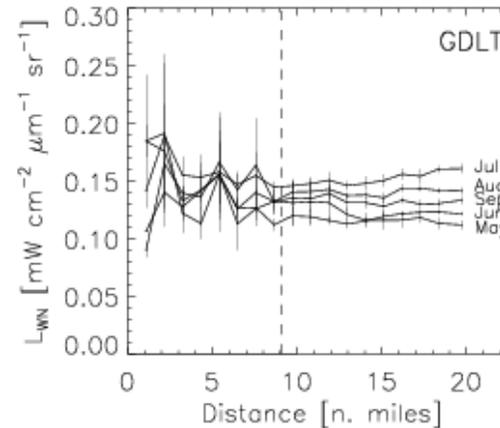
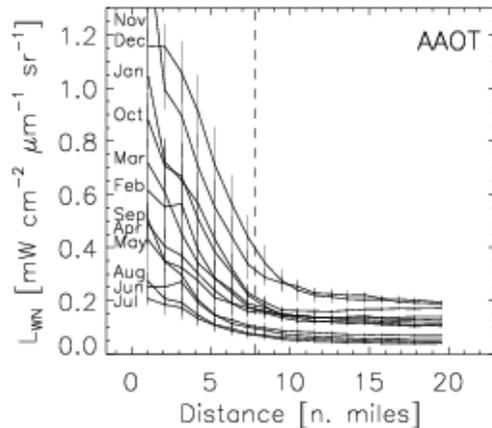


Adjacency Effects (Deployment Requirements +4)

Transects of SeaWiFS climatological $\tau_a(870)$



Transects of SeaWiFS climatological $L_{WN}(670)$



G.Zibordi, J.-F. Berthon, F. Melin, D.D'Alimonte and S. Kaitala. Validation of satellite ocean color primary products at optically complex coastal sites: northern Adriatic Sea, northern Baltic Proper and Gulf of Finland. *Remote Sensing of Environment*, 2009