**Bayesian Atmospheric Correction of Ocean-Color Imagery in the Presence of Absorbing Aerosols**

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The ability of a Bayesian methodology to invert satellite ocean-color data in the presence of absorbing aerosols is evaluated theoretically and experimentally. The solution of the inverse problem is expressed as a probability distribution, which measures the likelihood of encountering specific values of the spectral water reflectance, given the observed spectral top-of-atmosphere reflectance. Expectation and covariance are computed, which gives for each pixel an estimate of the water reflectance and a measure of its uncertainty. Spectral information in the visible to near infrared, including at wavelengths sensitive to aerosol absorption, is used. Theoretical performance is generally good, with water reflectance biases between -0.001 and 0.001 and standard deviations <0.005 in the blue for pollution- and continental-type aerosols. Application to SeaWiFS imagery of the Sea of Japan and East China Sea acquired during dust events provides water reflectance retrievals with less spatial noise than the standard SeaDAS algorithm and more realistic values compared with in situ measurements (negative biases significantly reduced). Further improvements are expected by observing in the ultraviolet, where the influence of absorbing aerosols is larger. Auxiliary information about aerosol characteristics, such as optical thickness and vertical distribution, obtained for example from an aerosol transport model, would help to reduce retrieval uncertainties (with additional prior information some of the possible solutions would become less likely).

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