**ASSESSING THE UNCERTAINTY OF THE OCEAN WATER BIDIRECTIONAL REFLECTANCE MODEL**

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In ocean color remote sensing, the bidirectional reflectance of the ocean water is used to correct the effects of the angular dependence of the water leaving radiance. This angular distribution is quantified by the f and Q factors, where the f factor is the irradiance reflectance; and the Q factor is the ratio of upward irradiance to the in-water slant upward radiance. Morel, Antoine, and Gentili (2002) have created a look-up-table (LUT) of the f and Q factors based on bio-optical models and radiative transfer simulations (hereafter referring to as MAG2002). In this work we access the uncertainty of the MAG2002 LUT by independent radiative transfer simulations with variant ocean water inherent optical properties (IOPs). The radiative transfer model used in this work is the vector radiative transfer (VRT) model for coupled atmosphere and ocean systems based on the successive order of scattering method. An ocean water bio-optical model has been combined with the VRT model to calculate the f/Q factors systematically. The overall differences among this work and the MAG2002 LUT are smaller than ±10% for 81% of the cases covering all wavelengths, Chlorophyll a concentrations, and solar and viewing geometries. These differences are due to the different choices of ocean IOPs. The uncertainty of the f/Q factor is studied by perturbing three IOPs: I. particle scattering coefficient; II. absorption coefficient of the colored dissolved organic matter (CDOM); III. ocean water depolarization. This study contributes to understand the uncertainty of ocean color remote sensing.

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