

## **E1-05: An ocean colour model incorporating fluorescence**

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Spectral variations in reflectance at the sea surface determine the intrinsic colour of the ocean. Both elastic and inelastic processes (such as Raman scattering and fluorescence) contribute to reflectance. In this paper, we extend an elastic scattering model of sea surface reflectance to deal with the effect of fluorescence on reflectance. The model presented here is based on the quasi-single-scattering approximation of Gordon (1974) and is an extension of the elastic scattering model of Sathyendranath & Platt (1997).

The analytic solutions derived here are valid for a vertically homogeneous and optically-deep water column. This fluorescence model includes one first order term (fluorescence only) and 2 second order terms (result from a combination of an elastic scattering and fluorescence where one is an elastic scattering event

followed by fluorescence emission while the other is fluorescence emission followed by an upward elastic scattering event). The emission spectra of fluorescent substances is assumed to have a Gaussian shape peaked around 685 nm.

The first order term contributes completely to the enhancement of the reflectance at sea surface near 685 nm where elastic scattering does not have much contribution. The contribution from the 2 second order terms is typically of the order of 1% of the first order term. Results from the analytic model are compared with some observed reflectance data and they are in close agreement.

Financial assistance by START Secretariat, USA and Bedford Institute of Oceanography, Canada are acknowledged.