**Modeling the scattering properties of particle suspensions in**

**Singapore coastal waters with an analytic phase function**

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ABSTRACT:

The scattering phase function of a particle suspension quantifies the angular pattern of light that it scatters, and can be modeled analytically. In this work, we describe how such a model, the Fournier-Forand phase function, is used to model the scattering properties measured in Singapore coastal waters to derive the relative refractive index and slope factor of the Junge-type particle size distribution (PSD) of the suspensions, which is assumed in the model, as well as present our preliminary results. These important quantities can be used to characterize the properties of the particles and suspensions. A WET Labs AC-9 meter was used to measure the absorption and attenuation coefficients while the volume scattering function was concurrently measured by a WET Labs ECO-VSF3 on 5 separate days in a coastal location in Singapore. The scattering coefficient was then readily calculated by subtracting the absorption coefficient from the attenuation coefficient. The volume scattering function was divided by the scattering coefficient to yield the scattering phase function. The derived phase function was subsequently fitted with the Fournier-Forand phase function by adjusting the model’s relative refractive index and slope parameter of the PSD, by using a non-linear least squares optimization program. It was found that most of the relative refractive indices derived were in e range 1.05-1.1, while most of the slope parameters were in the relatively broader range of 3.5-4.25.

KEYWORDS: scattering phase function, coastal waters, particle size distribution, refractive index, slope parameter

Suggested topics:

* Coastal zone
* Urban monitoring
* Climate/environment
* Data processing

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