

## ***Interactive comment on “Oceanic phytoplankton, atmospheric aerosol and Raman scattering impacts on space-based ultraviolet radiance measurements” by R.-M. Hu and R. S. Sokhi***

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We think this is an interesting study but feel that some major issues are missing or confusing:

- References: Some important references are missing or misleading:
  - p14352: Chance and Spurr (1997) were focusing primarily on the improvement of spectroscopic parameters for Rotational Raman scattering modelling. They have not investigated the size (or importance) of the Ring effect on BUUV measurements. Instead, "Rotational Raman scattering (Ring effect)

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- in satellite buv measurements", Joiner et al, JGR, 1995 needs to be cited. Also "Ring effect: Impact of Rotational Raman scattering on Radiative Transfer in Earth's Atmosphere", JSQRT, Vountas et al. (1998), clearly quantifies the impact of the Ring effect on retrievals of atmospheric parameters and is not mentioned.
- p14353, line 10-12: this sentence "It has been understood that the constituents in oceanic waters such as pigment chlorophyll-a in phytoplankton could affect the water reflectance significantly and lead to the variability of ocean reflectance in the ultraviolet." should end with the citation of the paper "Spectral studies of ocean water with space-borne sensor SCIAMACHY using Differential Optical Absorption Spectroscopy (DOAS)", Ocean Sci., Vountas et al., 2007.
  - Chance and Spurr (1997) were focusing primarily on the (important) improvement of spectroscopic parameters for Rotational Raman scattering modeling and showed a potential way to remove spectral features from measurements affected by the Ring effect. They have not investigated the size (neither the importance) of the Ring effect on BUV measurements. Instead, "Rotational Raman scattering (Ring effect) in satellite buv measurements", Joiner et al, JGR, 1995 needs to be cited. Also "Ring effect: Impact of Rotational Raman scattering on Radiative Transfer in Earth's Atmosphere", JSQRT, Vountas et al. (1998), clearly quantifies the impact of the Ring effect on retrievals of atmospheric parameters and is not mentioned.
  - p14355: a reference given here is confusing: Chance and Spurr (1997) have not focused at all on in-water radiative transfer. In fact, important applied work in the field of Raman scattering in water and its impact on quantities related to radiation has not been cited: "Inelastic scattering in ocean water and its impact on trace gas retrievals from satellite data", Vountas et al., ACP (2003) and "Retrieval of cloud pressure and oceanic chlorophyll content using Raman scattering in GOME ultraviolet spectra", Joiner et al., JGR, S6635

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- Reflectance (Eq. 8) and Raman scattering: there is information about the amount of light scattered from other wavelengths  $\lambda'$  towards the wavelength of interest  $\lambda$ , but I could not find any hint what is done to take into account the loss of radiation (through Raman) at  $\lambda$ . Neglecting the loss of radiation will lead to a bias.
- The reflectance used here is Vassilkov et al.'s formula (2003) which is derived from Sathyendranath and Platt (1998). As far as we know they have developed and validated their model for case-1 waters, so the claim to be able to model case-1 and 2 waters could be problematic.
- p14356, line 13-15: differences between both graphs in Fig.3 are related to chl conc., but it is not clear what chl conc. is meant, is it the one shown in Fig. 4?
- p14356, line 17: chl conc. data shown in Fig. 4 have to be from SeaWiFS only, because MODIS-Aqua data only exist from July 2002 onwards and MODIS-Terra data are not used for retrieving chl conc. maps for public use.
- p14357, line 4-5: the large differences of Aerosol Index are found in January 2001 in the high southern latitudinal oceans which actually is during the austral summer, not winter.

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