

# ***Interactive comment on “Ship borne rotating shadow band radiometer observations for the determination of multi spectral irradiance components and direct sun products for aerosol” by Jonas Witthuhn et al.***

## **Anonymous Referee #5**

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The manuscript “Ship borne rotating shadow band radiometer observations for the determination of multi spectral irradiance components and direct sun products for aerosol by Witthuhn et al. requires significant revision before it can be considered for publication. The manuscript is interesting and relevant, it just needs to be rewritten.

The manuscript has been carelessly prepared and that severely detracts from what should be the message of the paper. Rather than provide a detailed review, at this point, I would prefer to point out three specific examples that form the basis of my opinion that the paper needs significant revision before it should even be considered

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for publication.

Starting with what should be a straightforward description of the instrument, the GU-Vis instrument is described in the abstract as “The 19 channel rotating shadow band radiometer. . .” while the instrument description on p.3 (line 18, section 2 Instrumentation) states that “GUVis radiometer is a multi channel filter instrument. . .with 18 spectral channels”

In the Introduction to the paper on p.2 line 20, the authors state “In addition, it provides direct information about radiative fluxes. . .” this statement is not true. The instrument does not measure fluxes.

Similarly, the statement (line 25 of the Introduction p. 2) “The simultaneous measurements with the shadow band radiometer of aerosol optical properties and radiative fluxes avoids inconsistencies in calibration which are unavoidable if multiple detectors are used. Aerosol size distributions can be obtained from the spectral dependence of AOD. . .” is also untrue. First, I have already objected to the term “flux” to describe the measurement. Second, while I agree that calibration would be more of an issue with multiple detectors the instrument contains multiple filters that are more of a problem for spectral calibration than multiple detectors would be. Third, the instrument uses multiple detectors: namely silicon photodiodes are used for wavelengths up to 1020 nm while indium gallium arsenide detectors are used at longer wavelengths.

While revising the manuscript, the authors should consider expanding their discussion of the cosine correction. On p. 7 (lines 6-10) they state that they are using the measurements provided by the manufacturer. They should specifically examine their data for errors in this cosine characterization which should be filter dependent and therefore introduce a spectrally-dependent source of error/uncertainty which would show up in an examination of daily time series of retrieved aerosol properties and add some discussion to Section 4.4 (Discussion of the Uncertainty). Doing this would allow the authors to separate the spectral uncertainties due to errors (uncertainties) in the characteriza-

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tion of the filter response function and errors (uncertainties) in the characterization of the cosine response of the filters.

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