



IMPROVED GROUND BASED SKY CAMERA FOR STUDIES OF ENHANCED SPECTRAL UV IRRADIANCE

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A recent World Meteorological Organisation report discussed the importance of continued study of the effect of clouds on the solar UV radiation reaching the earth's surface. The report mentions that the use of all-sky imagery offers the potential to understand and quantify cloud effects more accurately. There are an increasing number of studies investigating the enhancement of surface UV irradiance, and UV actinic flux, using automated CCD and sky cameras. This paper describes image-processing improvements and new algorithms applicable to a commercially available, relatively low cost all-sky camera (TSI-440), we use for investigating cloud enhanced spectral UV irradiance. Specifically, these include improved shadow band masking, and the addition of three new algorithms relating to cloud amount at different spatial positions and the visible brightness of clouds surrounding the sun. We also present a summary of 5-minute resolution cloud enhanced UV index and spectral UV irradiance over a 5-month period at a Southern Hemispheric sub-tropical latitude site using these new techniques, as well as how these findings relate to the current literature on this topic.