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A13A-06 ***Poster***

Aerosol Optical Thickness Influence Over the Photosynthetically Active Radiation (PAR) in Earth Surface

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The atmosphere is made up of several components, among them are present solid and liquid particles in suspension called aerosols. Aerosols make an important role by absorbing and reflecting radiation from space. The work aims to evaluate the relationship between aerosols and Photosynthetically Active Radiation (PAR) reaching the earth's surface on cloudless-sky days with development of statistical models. PAR radiation data were acquired in the SONDA Project network sites located in Campo Grande - MS, Cuiabá - MT and Petrolina - PE. In addition, data acquired in Alta Floresta - MT were provided by AERONET. Aerosol Optical Thickness (AOT) daily average data for all stations were obtained from the AERONET. The time periods vary according to PAR and AOT data availability in cloudless-sky days. For Campo Grande, 43 clear sky days in 2008 were analyzed; 116 days from 2006 to 2008 for Cuiabá; 31 days for the years 2005 and 2007 in Petrolina; and for Alta Floresta 30 days from 1999 to 2003. Most of the available data occurs in June, July and August due to dry season in Brazilian Mid-West and Central regions. Due to the spectral range of the PAR radiation, 400 nm to 700 nm, AOT data at wavelengths 675 nm, 500 nm and 440 nm were used in this work. Linear, polynomial of second degree and exponential empirical models were developed with 70% of the available data relating the KPAR parameter and AOT at the specified wavelengths. The KPAR index is defined as the ratio between the daily PAR irradiation at the surface and the solar radiation incident on the top of the

atmosphere. The 30% of the remaining data were used to evaluate model performance. The statistical deviations MBE (Mean Bias Error) and RMSE (Root Mean Square Error) were used for the models validation. In general, all models showed satisfactory performance, as indicated by low statistical deviations. The polynomial models have presented higher deviations from that of the others regressions models used. The polynomial models achieve RMSE values of 11.54% for Alta Floresta in the wavelength of 500 nm, while the exponential and linear models showed, respectively, 2.94 % and 5.78%. The statistical models showed lower deviations at Campo Grande and Petrolina with an RMSE values around 1.5%. For the future, it is intend to perform further analysis with larger data numbers aiming better performance for empirical models, using also, data from the Reference Station SONDA - SMS, installed at the Southern Space Observatory - SSO/CRS/CCR/INPE - MCT, (29°26' S 53°48' W), for a Brazilian territory extensive investigation.

[0305] ATMOSPHERIC COMPOSITION AND STRUCTURE / Aerosols and particles

[0360] ATMOSPHERIC COMPOSITION AND STRUCTURE / Radiation: transmission and scattering

[9900] CORRECTIONS

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