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PARAMETERIZATION OF BIOMASS BURNING AEROSOLS IN THE BRAZIL-SR RADIATIVE TRANSFER MODEL.

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This work describes the impact of the aerosols that are generated during biomass burning events in the solar irradiation, and presents a parameterization technique to improve the model estimations of the surface incident solar irradiation obtained by the BRASIL-SR radiative transfer model. It was verified that the mean systematic deviation error (MBE) of model estimates grows about 3 times and the value of root mean squared error (RMSE) duplicates in clear sky days for stations close to burned sites in central region of Brazil. The proximity of burned sites produces an increment of the same order of that produced by the presence of clouds in MBE. The parameterization technique of the biomass burning aerosols uses optical properties provided by "Global Aerosol Data Set" (GADS) and it is in accordance with measurements values obtained in two field missions: TRACE-A (1992) and SCAR-B (1995). Three different compositions were used in this study and the difference among them is the ratio of black carbon present in the aerosols: 5%, 7.8% and 10% of black carbon. These values are within the range of measured values observed in the field missions: from 4% to 12%. The aerosol profile and spatial distribution was obtained from a transport model for estimation of tracers spreading from biomass burning areas developed at INPE-CPTEC.

The surface incident solar irradiation estimates, obtained with new aerosol parameterization, presented smaller systematic deviations in all the stations used in the validation process. The correlation among estimated and measured values for surface incident solar radiation grew about 2,5 times by adopting a composition with 5% of elementary carbon. The validation procedure showed that the improvements in

aerosol parameterization allowed for better estimates by the model. However, the improvements are still masked by limitation imposed by the availability of only tri-hourly image schedules for the GOES-8 satellite in Southern Hemisphere.

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