Characterization of downward atmospheric long wave radiation in the city of São Paulo – Modeling and observational description

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1. Objectives

The objective of this work is to describe the diurnal evolution of downward atmospheric long wave radiation (LW) in the city of São Paulo. In addition, it was examined the performance of 10 empirical models of LW estimative, (Niemelä et al., 2001) in reproducing the diurnal cycle of the downward atmospheric LW.

2. Materials and Methods

This work is based on 5 minutes values of LW, air temperature and relative humidity, observed simultaneously from 1997 to 2006 in a micrometeorological platform located at IAG-USP. The Neural Network technique was applied to correct the pirgeometer's dome emission effect, (instrument that measures LW). A filter was applied to remove the bad data. The monthly average values taken at IAG were compared with the values of SRB-NASA, (Gupta *et al., 1998*). The 5 minutes evolution of LW for clear-sky days was estimated using 10 empirical models and was compared with the observed values.

3. Results and Discussion

The Neural Network technique correction for the emission effects of the pirgeometer's dome was approximately 15 Wm^{-2}. The monthly average values of LW matches well with the SRB-NASA data. All the empirical models overestimated the LW and presented a better result during nighttime.

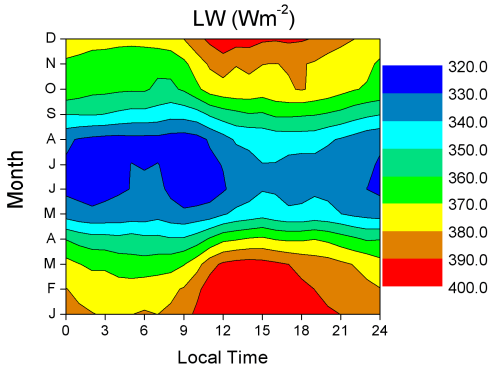

Figure 1: LW observed values versus local time and month.

4. Conclusion

The Neural Network technique was a reliable method for the correction of pirgeometer's dome effect. The NASA data confirmed the quality of the observations taken at IAG-USP. The Brunt's model presents the best results, with the smallest MBE, RMSE and the biggest d-Willmott.

5. Acknowledgment

We acknowledge support provided by the CNPq and FAPESP. The SRB data were obtained from the NASA Langley Research Center Atmospheric Science Data Center.

6. Bibliography

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