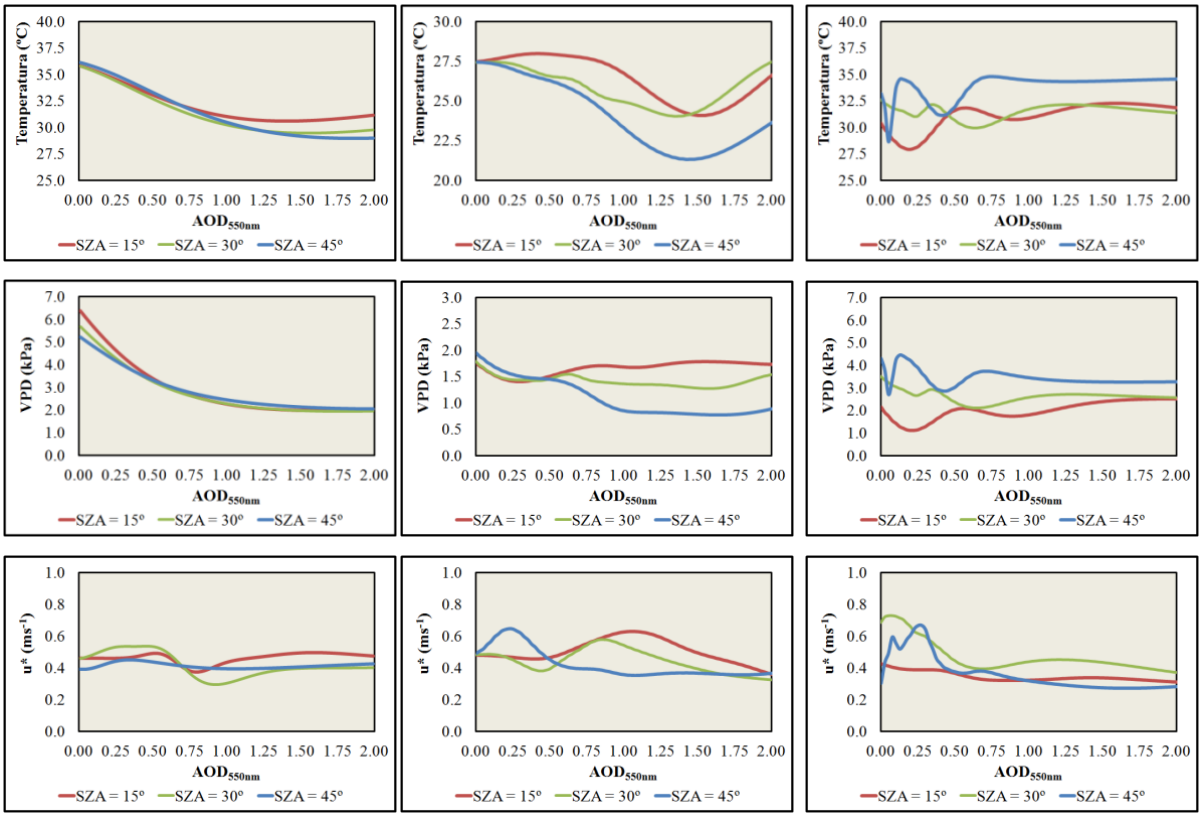
Supplement material



a. Bananal Island - TO **b. Rebio Jaru - RO** **c. Sinop - MT**

Figure 1: Temperature (ºC), VPD (kPa), and friction velocity (u*, ms-1) calculated through ANNs varying with AOD_{550nm}. ANNs were used with values of PAR_i, PAR_{dif} generated by libRadtran, for three SZAs (15º, 30º, and 45°), for all three study sites.

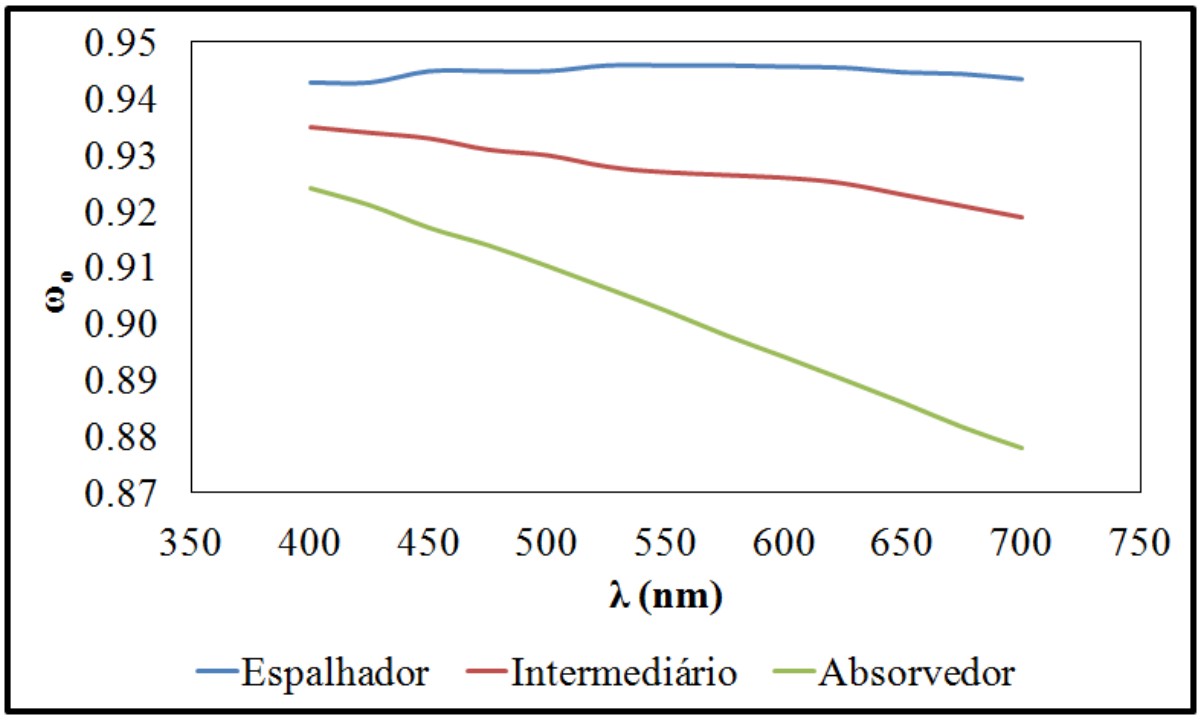


Figure 2: Spectral single scattering albedo (ω_0) as a function of the wavelength λ (nm), in three different types of aerosol: scattering, intermediate, and absorbing. These functions were developed based on the Mie theory from AERONET data for three study sites in the South of the Amazon basin (Rosário et al. (2011)).

Table 1: Statistical indices generated from the comparison between observed variables T, VPD and u* (validation group) and the modelled ones by the ANNs, for all three experimental sites.

	Bananal Island - TO			Rebio Jaru - RO			Sinop - MT		
	T	**VPD**	**u***	**T**	**VPD**	**u***	**T**	**VPD**	**u***
Pearson coefficient	0.57	0.92	0.49	0.68	0.93	0.57	0.47	0.91	0.64
RMSE	2.11	0.39	0.15	1.76	0.21	0.12	2.33	0.42	0.14
MAE	1.70	0.34	0.13	1.41	0.17	0.10	1.73	0.37	0.11
Relative deviation	0.07%	1.19%	0.65%	0,22%	0.22%	2.09%	0.07%	0.13%	0.02%

Table 2: FCO_2 generated from ANNs for the three study sites and respective errors associated with the validation data.

	Ilha do Bananal - TO	Rebio Jaru - RO	Sinop - MT
Number of *Inputs*	330	162	237
		Data	
Mean	-7.1	-12.4	-17.3
Standard deviation	2.4	5.0	3.7
Maximum value	-1.2	0.7	-9.7
Minimum value	-14.3	-22.5	-28.3
		Coefficients	
Pearson	0.57	0.82	0.58
RMSE	3.20	4.29	5.69
MAE	2.43	3.62	4.78

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