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Atmospheric thermodynamic structure of the Amazonian convective Boundary Layer during the RBLE-3

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The thermodynamic structure of the convective boundary layer (CBL) in the atmosphere over the forest and grassland regions of the western Amazonia is investigated using the Rondônia Boundary-Layer Experiment (ABRACOS/RBLE-3) data. For this purpose, the saturation point approach and mixing line analysis are used. Since ABRACOS/RBLE-3 data were collected during a period of severe dry season, convection was suppressed and the development of penetrative cumulus clouds was inhibited. However, there is an enhancement of shallow cumulus clouds during the afternoon and night in the pasture. Due to the night-time radiative cooling a shallow stable layer is established near the surface over both the forest and grassland. The coupling of the surface layer with the subcloud mixed-layer layer seems to occur by 1800 UTC over the grassland while in the forest the coupling is not clearly seen in all the mean saturation pressure difference (P) profiles. Both the sensible heat flux at the surface and secondary thermal circulations may have important roles in determing the behaviour of the mixed-layer. Higher sensible heat flux in the pasture leads to a deeper mixed-layer compared to the forest. The air in the upper part of the subcloud mixed-layer over the grassland seems to be advected (by secondary thermal circulations) from the forest while in the forest it seems to be locally generated. The differences in the P minimum values (which represent the top of the entrainment layer) are not significant. Acknowledgements: The authors would like to thank to Dr. Alan K. Betts for their useful suggestions. ABRACOS/RBLE-3 was partially funded by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), Conselho Nacional Científico e Tecnológico (CNPq), and the Coordenadoria de Aperfeiçoamento de Pessoal de

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