

Flux Observations in Southern Brazil

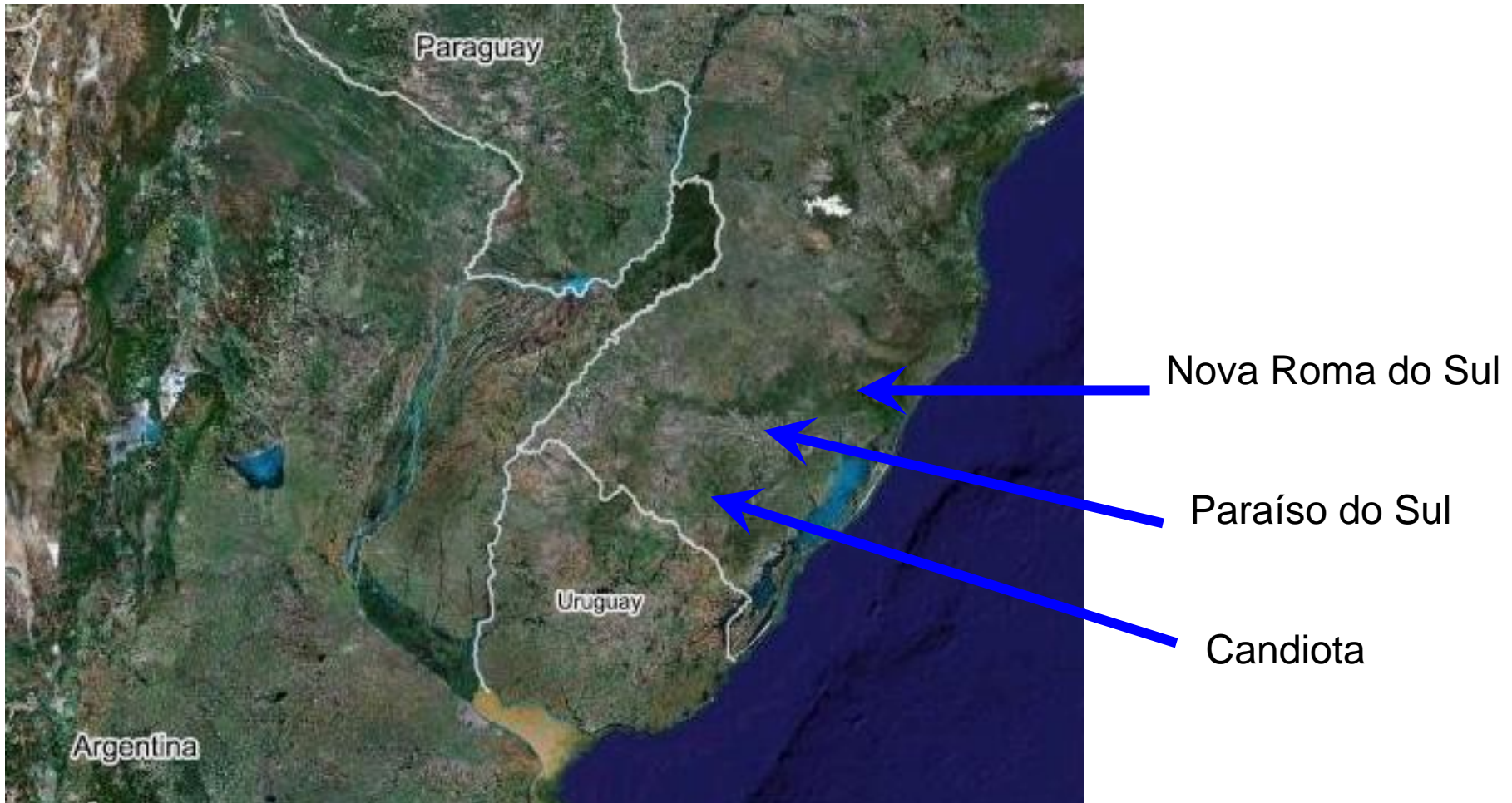
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Universidade Federal de Santa Maria



Laboratório de Micrometeorologia (LμMet)

- Since 1994, the UFSM Micrometeorology group conducts surface flux observations in southern Brazil;
- The group is composed by 4 professors, 10 Doctorate and 10 Master students;
- Research focuses on observational and theoretical aspects of turbulent interactions between the surface and the atmosphere;
- Since 2005, an undergraduate Meteorology school exists in Santa Maria, leaded by the LμMet researchers;
- Other research fields are being implemented since then, specially on climatic interactions and mesoscale circulations;
- In both cases, the research focuses primarily on Southern South American problems.

Flux observations in southern Brazil



Nova Roma do Sul, RS – since 2001



What is the problem?



- river elevation;
- wine production region;

CLIMATIC IMPACT???

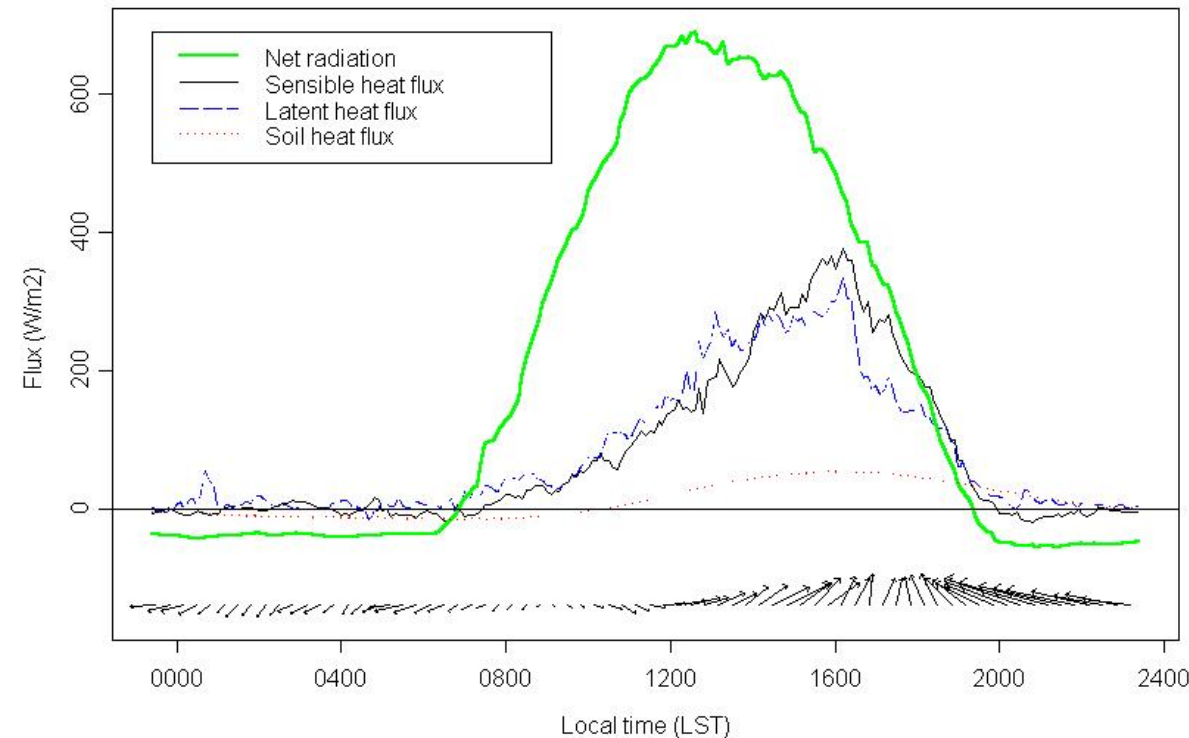
1st Part: november and december 2001



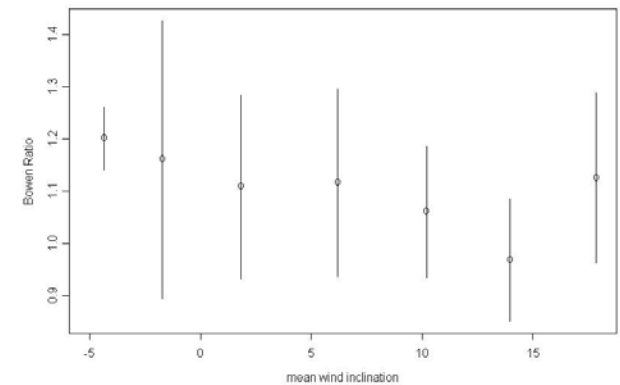
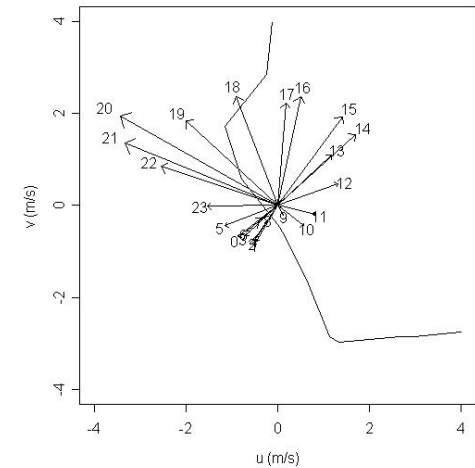
Main results

Acevedo, O. C., Moraes, O. L. L., Silva, R., 2002: Turbulence observations at the edge of a cliff. *Proceedings, 15th Symp on Boundary Layers and Turbulence*, Wageningen, The Netherlands, Amer. Meteor. Soc., 592-595.

Energy Budget



Nova Roma do Sul: mean wind directions



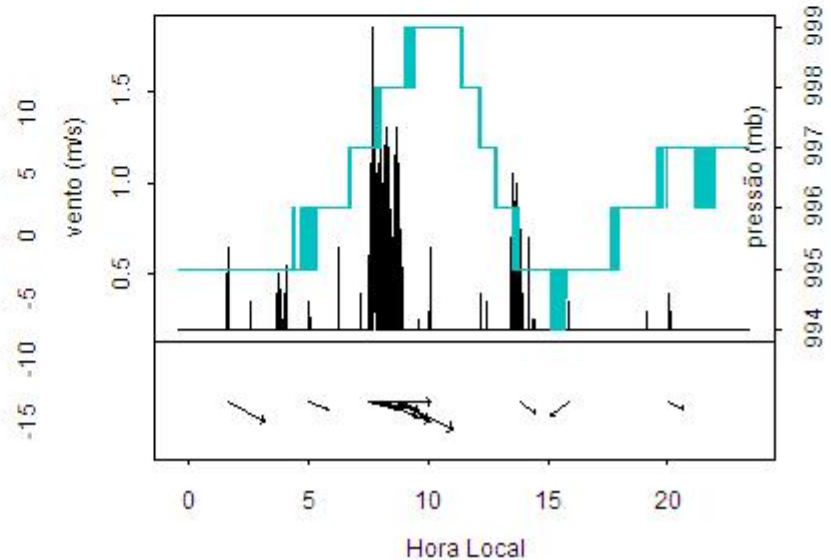
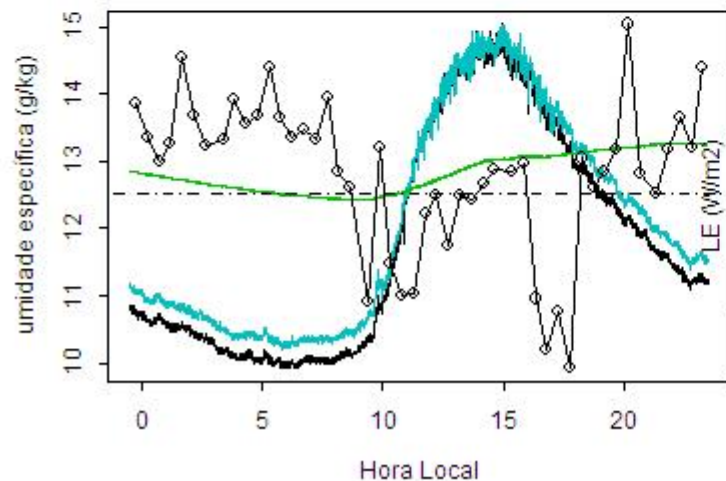
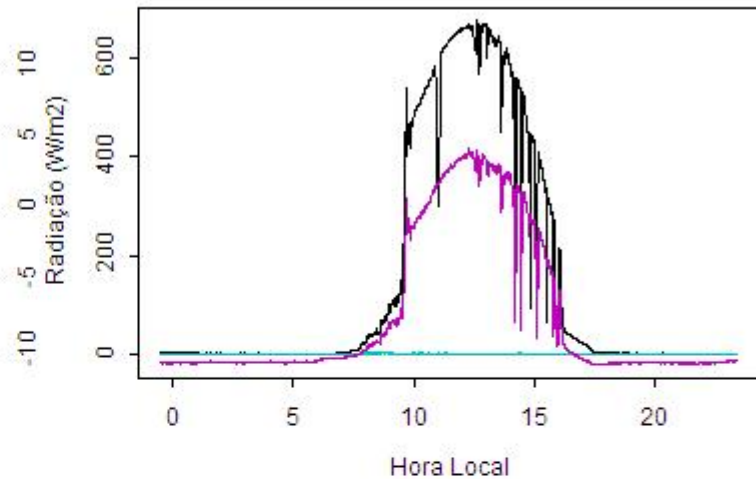
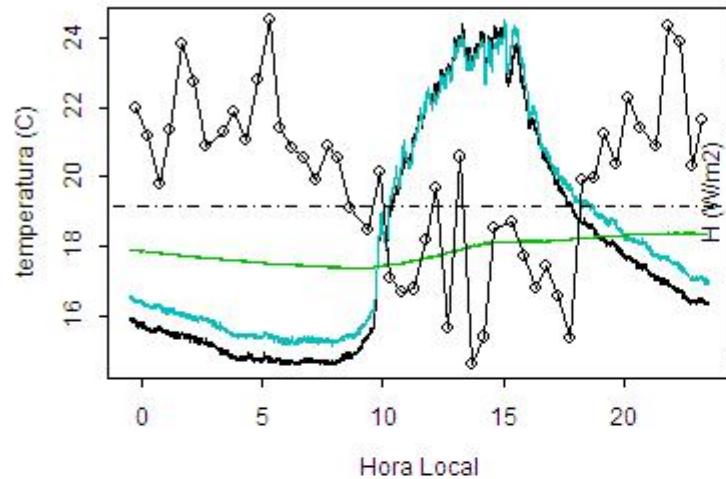
3rd Part: April to June 2005

Getting in the river



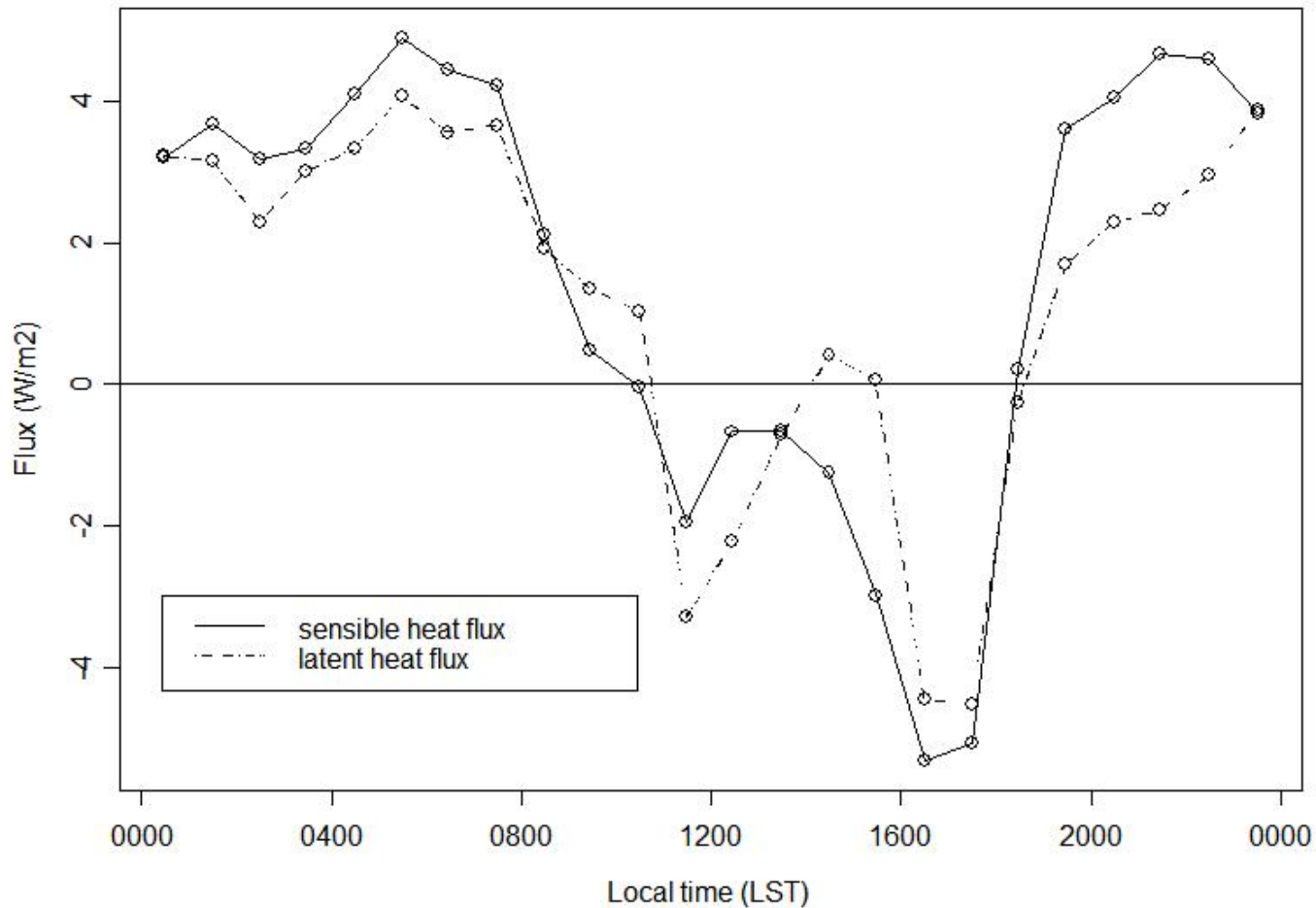
Fluxes: Daytime negative fluxes? Both sensible and latent heat?

Torre do rio, 03 de junho de 2005



Mean daily cycle

Nova Roma do Sul, mean fluxes



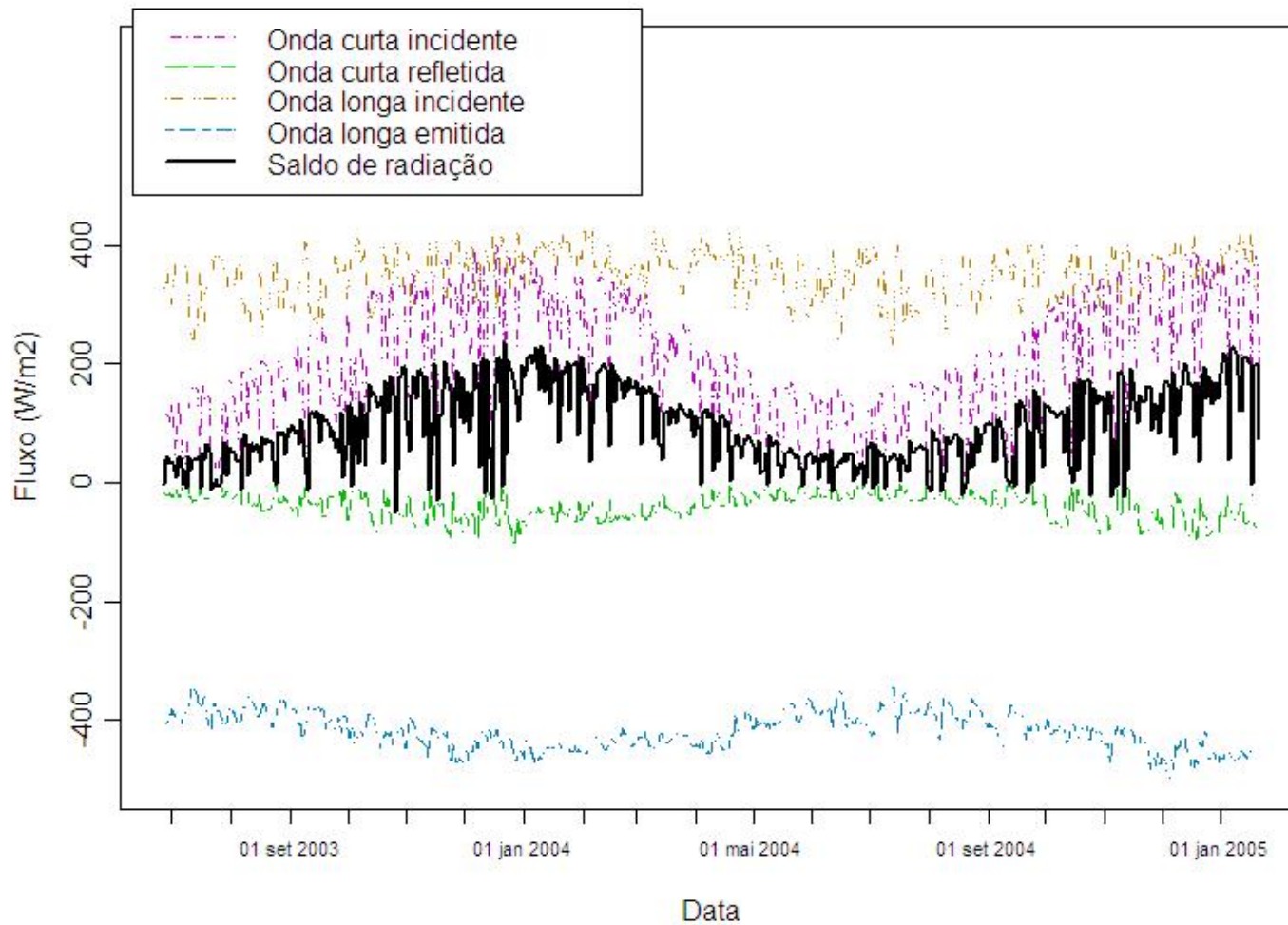
Results submitted to Journal of Applied Meteorology and Climatology

- Paraíso do Sul, RS, 2003 to 2006 (CT-HIDRO)



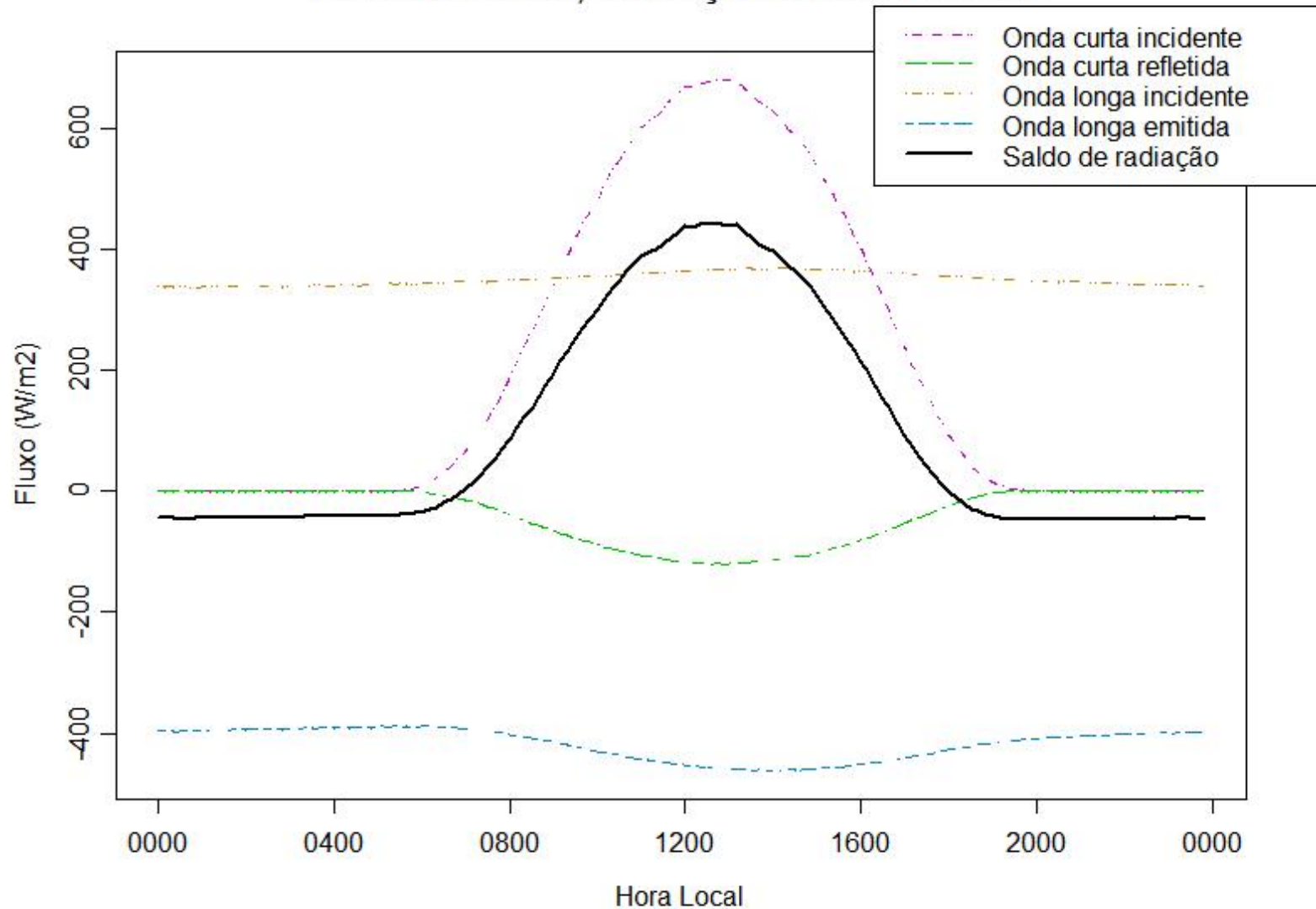
Radiation budget: temporal evolution

Paraíso do Sul, componentes do balanço radiativo: médias diárias



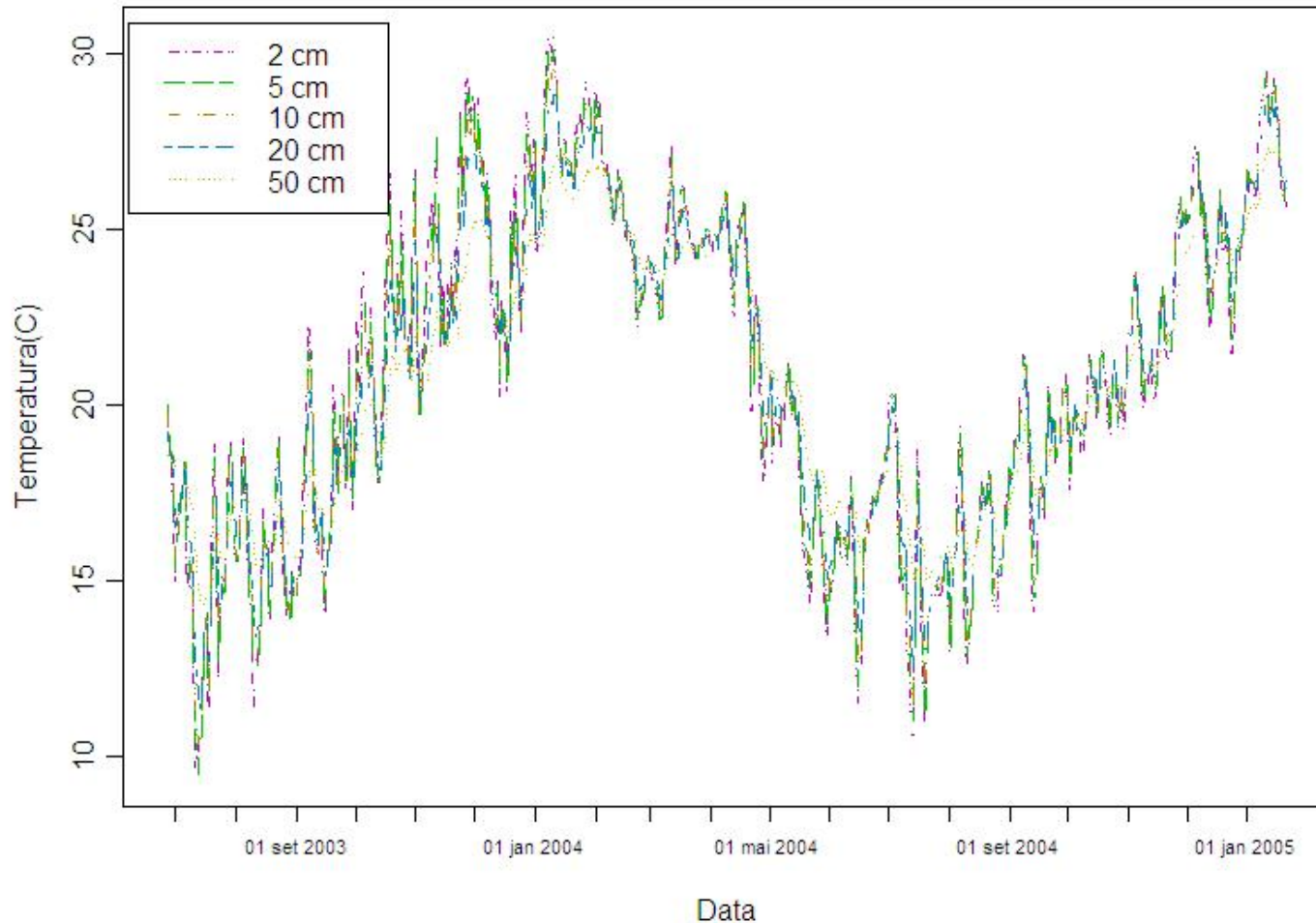
Radiation budget: daily averages

Paraíso do Sul, Balanço Radiativo médio



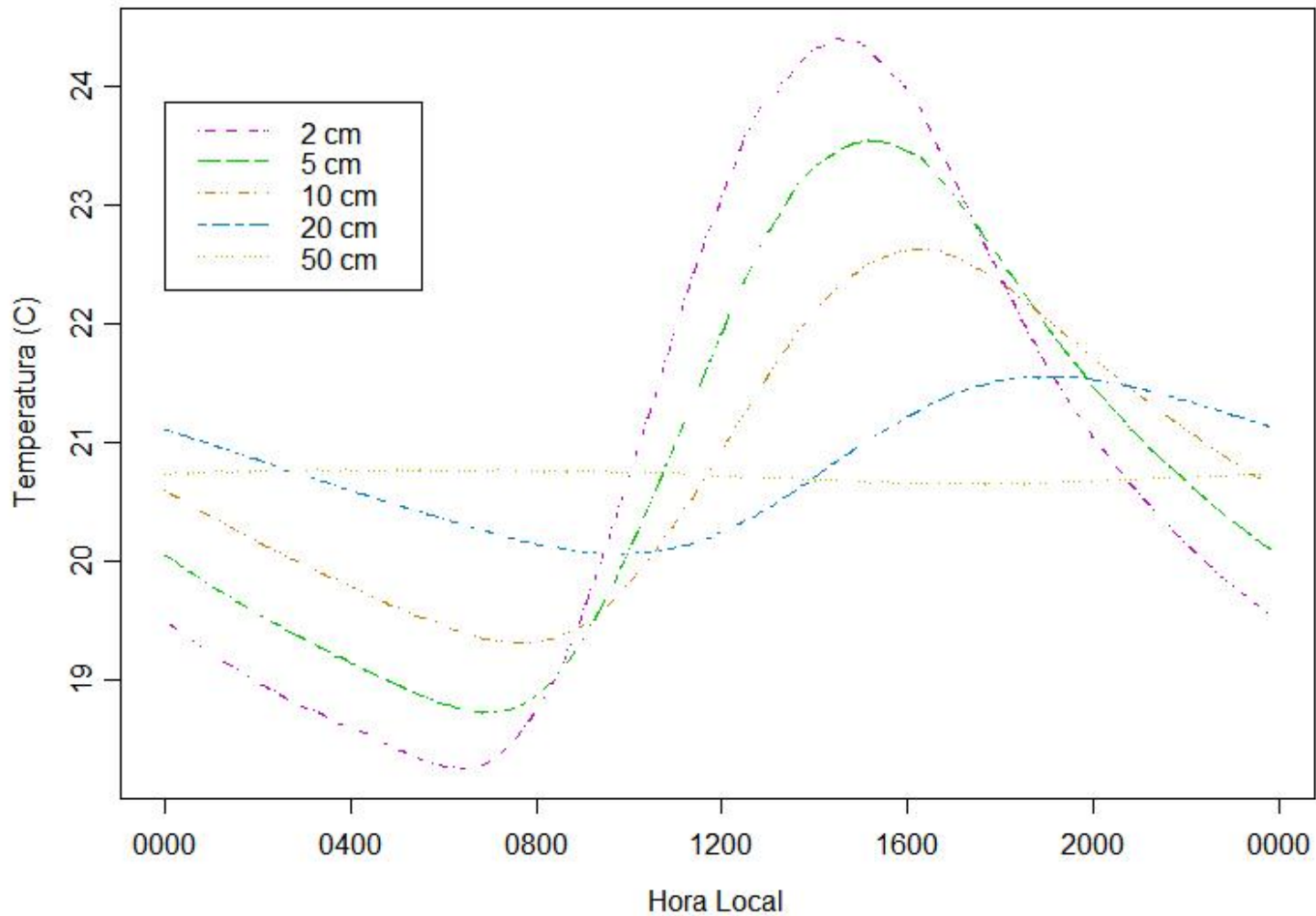
Temporal evolution of soil temperature

Paraíso do Sul, temperatura do solo: médias diárias



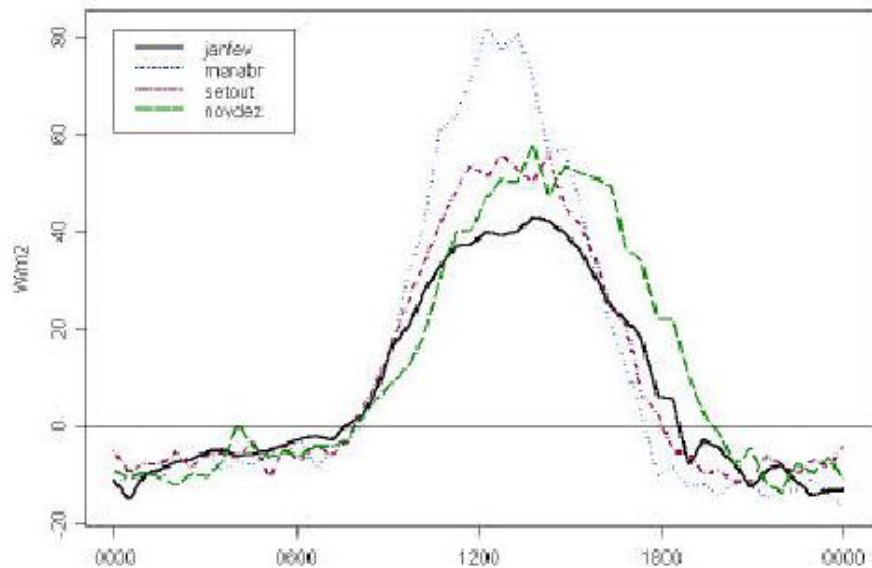
Average daily cycle of soil temperature

Paraíso do Sul, temperatura do solo média

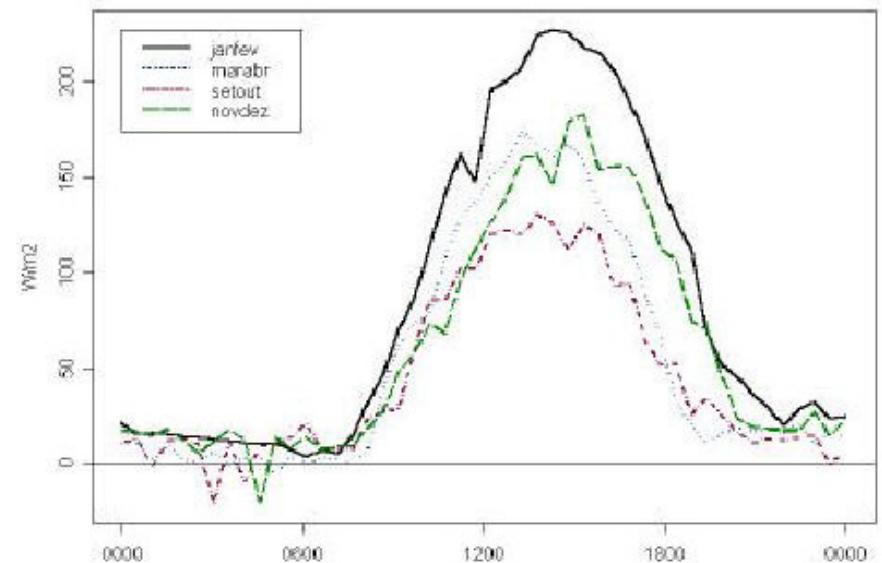


Turbulent fluxes: average daily cycle

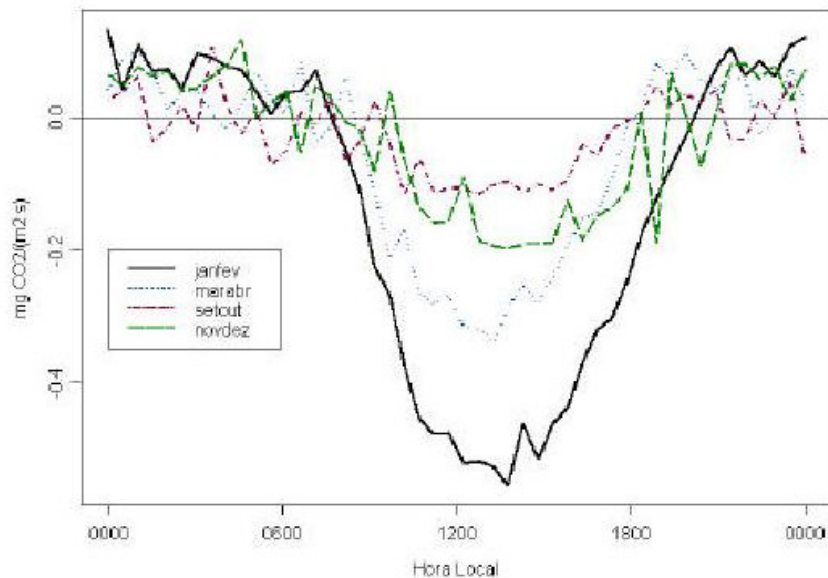
Fluxo de Calor Sensível



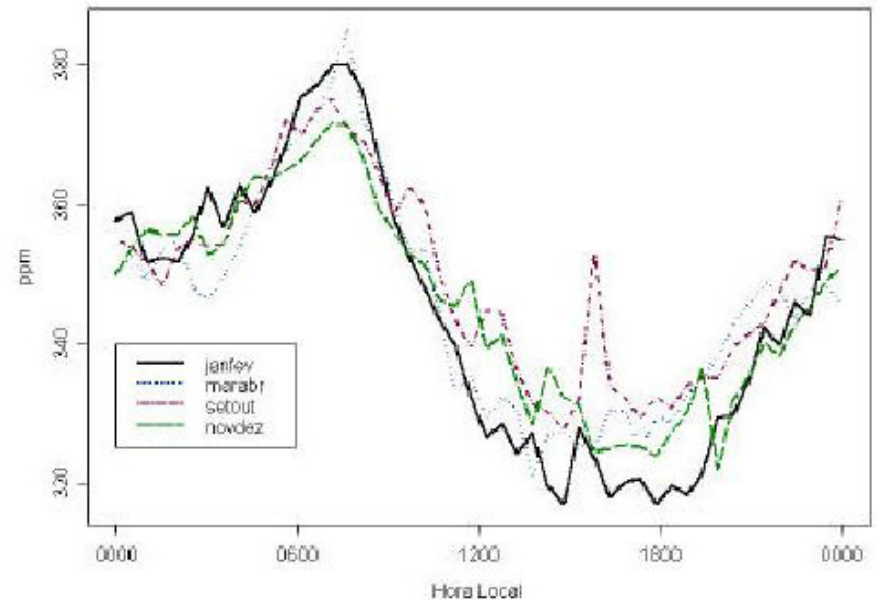
Fluxo de Calor Latente



Fluxo de CO₂



Concentração de CO₂

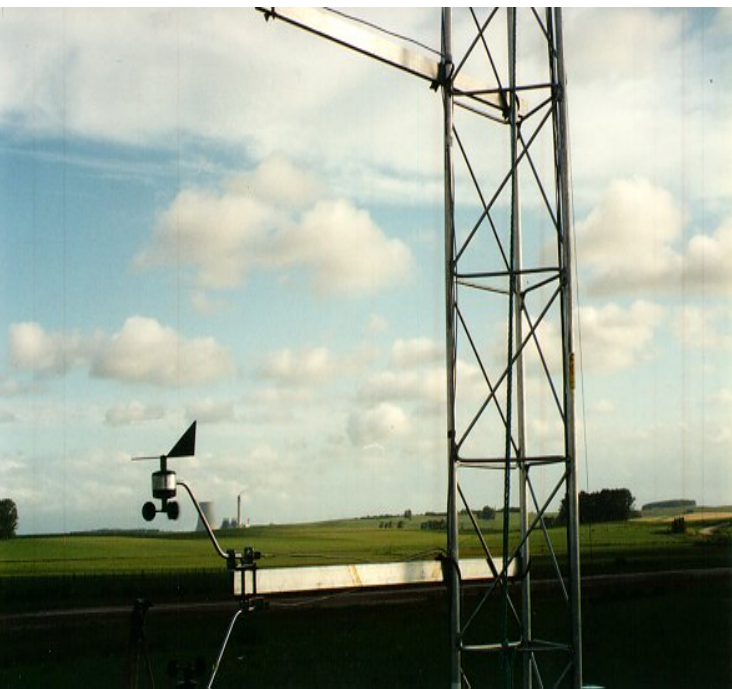


Candiota, RS, 1994 to 1995, restarting 2006



Experiments

- January 1994 (Pilot Exp.)
- Julho 1994 (Winter Exp.)
- Fevereiro 1995 (Summer Exp.)
- Maio 1995 (Fall Exp.)
- Novembro 1995 (Spring Exp.)



Starting in 2006, intensive monitoring of mean weather patterns and air quality will start. Flux campaigns will occur.

