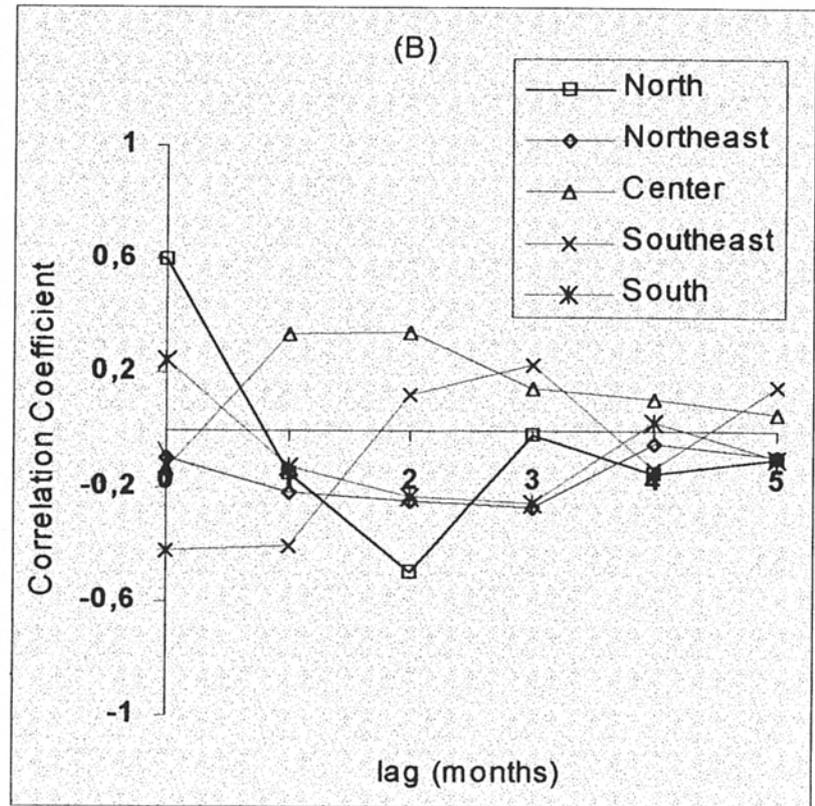
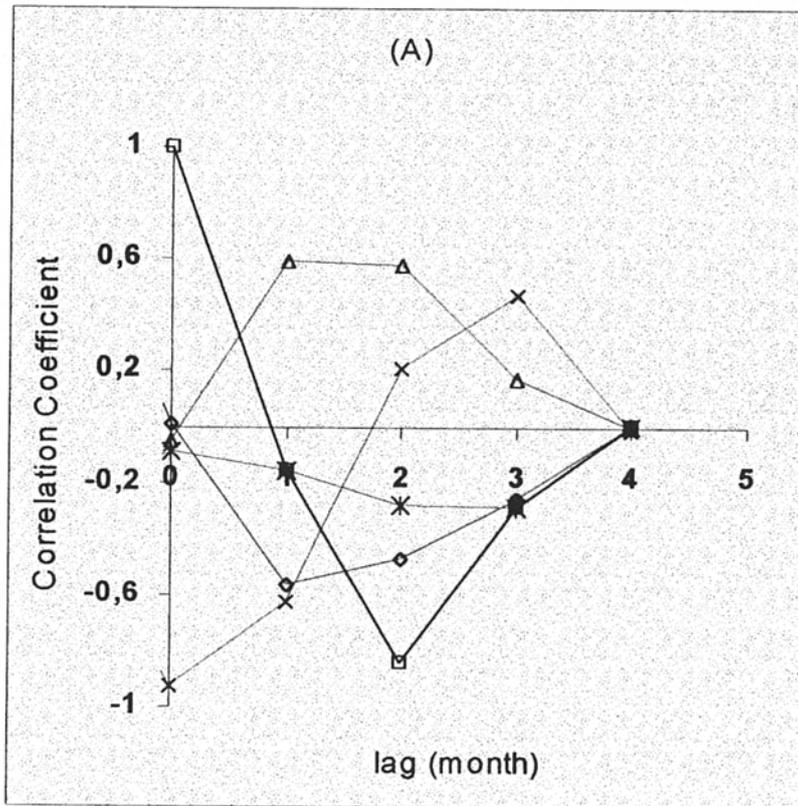
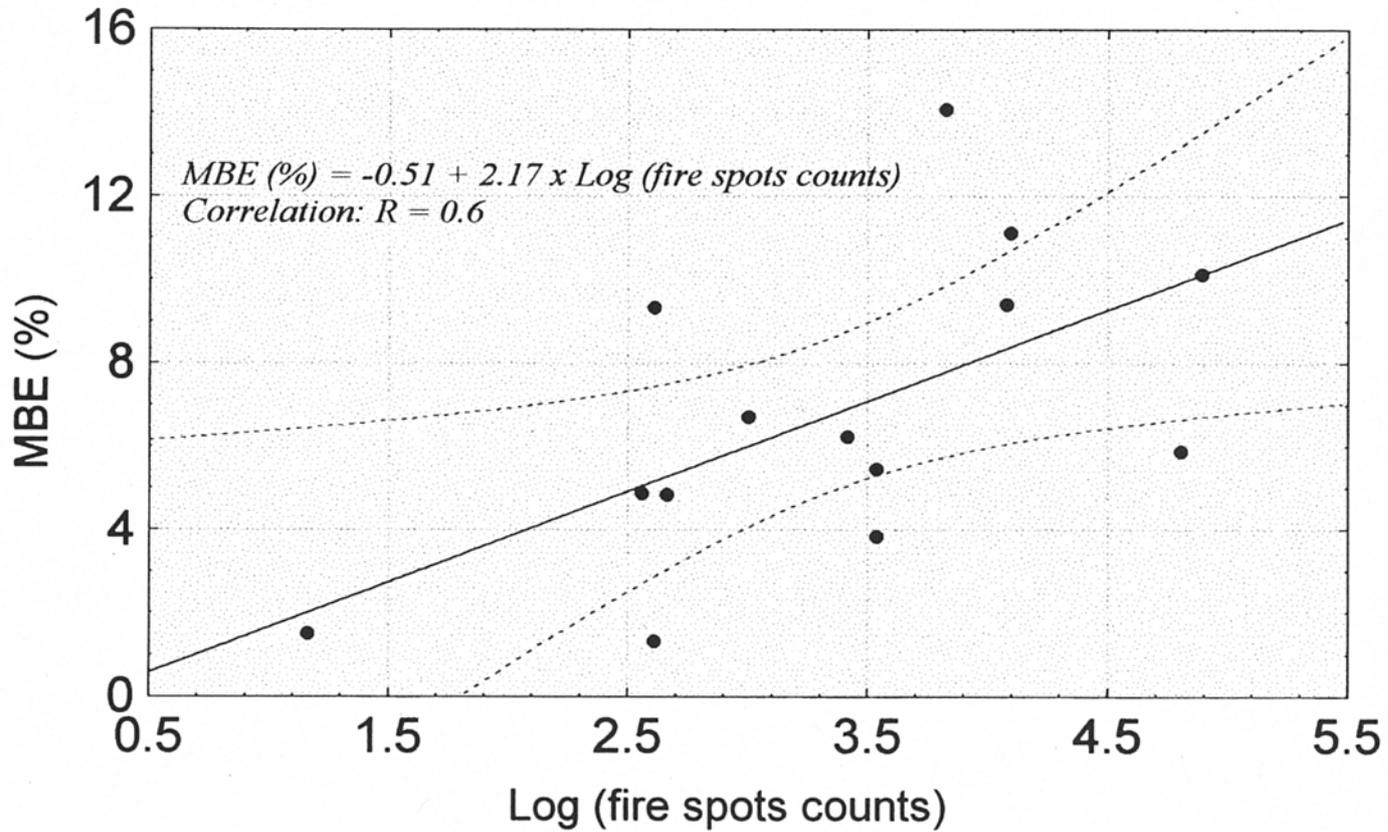


Cross correlation between time series for MBE and fire spots performed for validation sites located in the biomass burning area (A) and for a site outside this area, in Florianópolis (B).

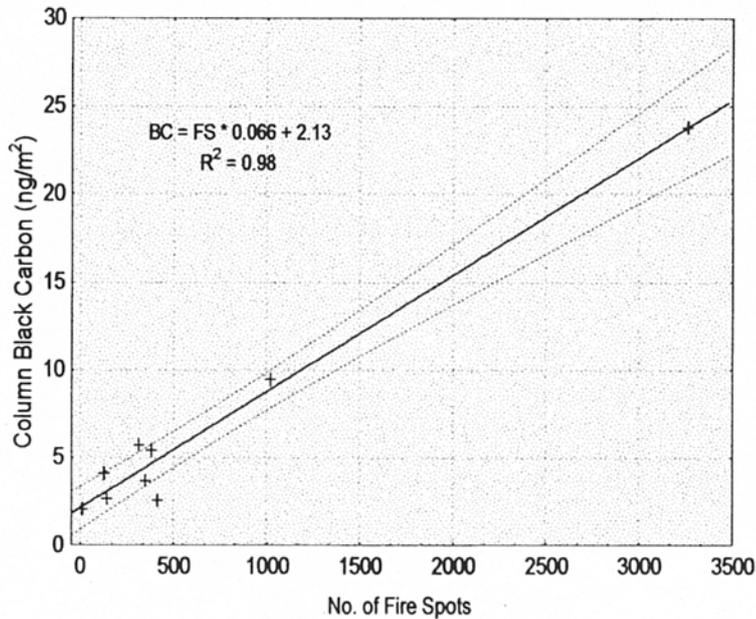


Plot of the relative mean bias error (MBE) and the logarithm of the number of fire spots counted inside a 2.5° circle of investigation around the ground solar station. The dotted line represents the 95% confidence level for the straight-line fitting



## Correlation coefficients between fire products and fire spots during biomass burning season

- Column concentrations of fire products were estimated by integrating over vertical profiles of data obtained during SCAR-B field mission in the Brazil (1995);
- Fire spots were counted inside 2.5° circles of investigation centered at each column concentration data site;
- All major fire products presented positive correlation with the fire spots.

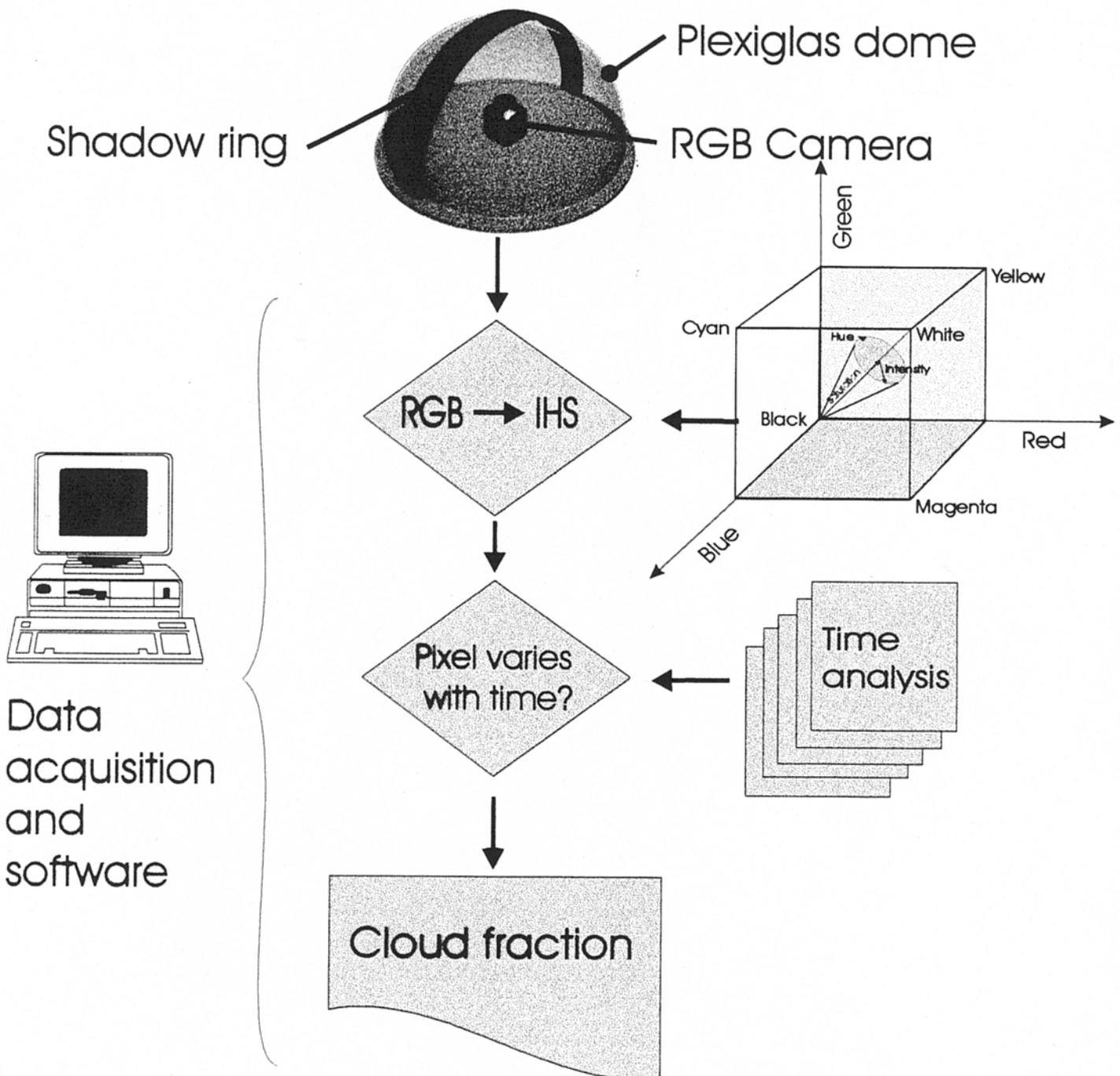


<i>Combustion Product</i>	<i>Correlation Coefficient (R<sup>2</sup>)</i>	<i>N<sup>o</sup> of profiles</i>
Total aerosol mass	+0.98	5
Black Carbon	+0.98	9
Submicron particle count number	+0.95	5
CH <sub>4</sub>	+0.90	5
N <sub>2</sub> O	+0.65	5
CO	+0.45	5

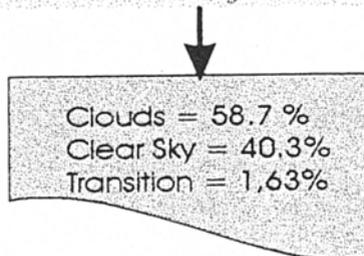
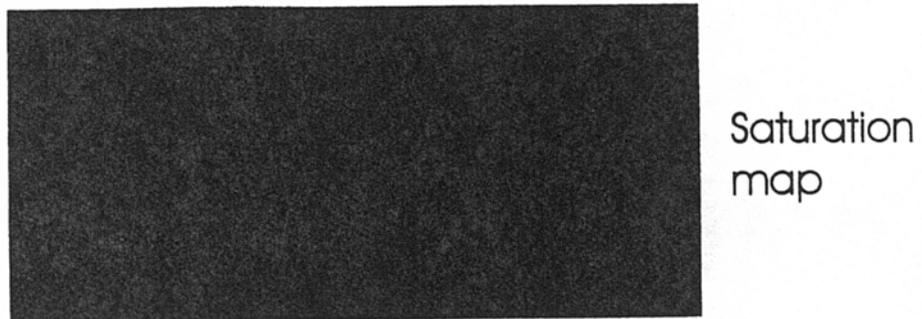
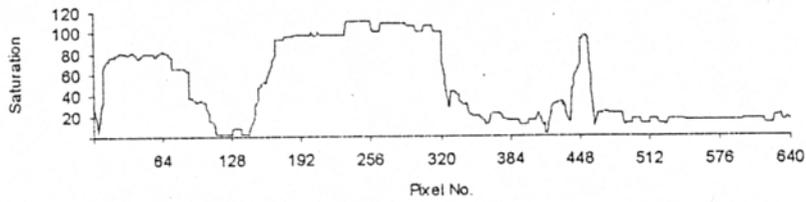
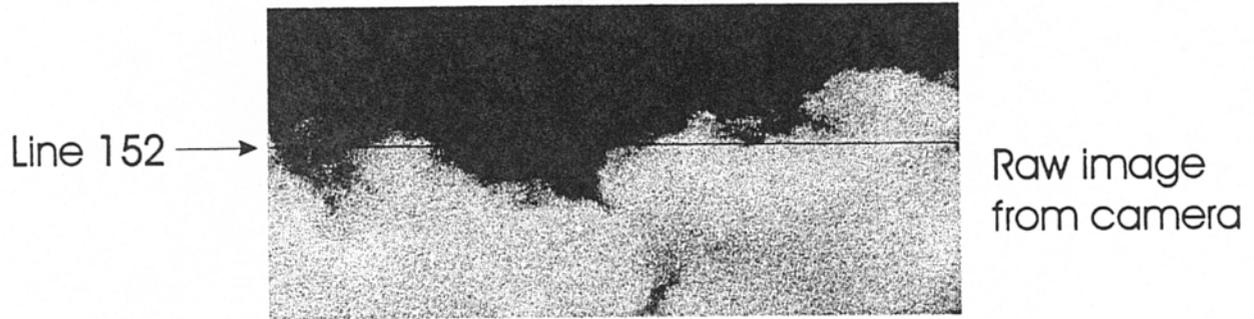
\* the + indicates a positive correlation

# Automatic Cloud Fraction Monitor

(ground data validation for satellite models)



# Result of Cloud Fraction Discrimination



# SOLAR RADIATION IN THE AMAZON DURING THE LBA

**SUBMITTED TO THE:** *Large-Scale Biosphere-Atmosphere Experiment in Amazonia*

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## **OBJECTIVES:**

- To enhance the existing network for ground-truth of satellite derived data.
- To provide a data basis on solar radiation at ground level over Brazilian Amazonian territory for various application and scientific processes.

## **MILESTONES:**

- Set up of four ground stations for solar radiation and basic meteorological data acquisition in distinct sites of the Amazon region.
- Provide on a routine basis qualified-compiled ground-truth radiation data for several satellite applications.
- Derive, on a routine basis, surface solar global, diffuse and photo-synthetically active radiation data using the BRAZIL-SR radiation model.
- Validate and inter-compare some existing satellite-based models for solar radiation.
- Set up of a historical data archive of visible/infrared GOES-8 satellite images for Brazil.
- Measure and compile aerosol concentration profiles data in the Amazon troposphere.
- Study of the effects of burning of biomass on the radiation measurements and estimations

## **Ground Solar Radiation Sites**

- Set-up three Solar radiation stations for global and diffuse radiation, and basic ground meteorological measurements – air temperature, wind speed, pressure, (UFSC-INPE-BMBF/Germany)
- Locations are: The Hydro-electrical power plant of Coaracy Nunes (Macapá)  
São Gabriel da Cachoeira (Northeast of the Amazonas)  
Hydro-electrical power plant of Samuel (Southeast of Roraima)
- Existing BSRN site at Balbina (UFSC - WMO/BSRN)

## **Provide Ground Radiation Data for Various Applications**

- Radiation data from these four radiation measurement sites will be provided on a routine basis qualified ground radiation data (global and diffuse short-wave)
- Data will be acquired via telephone modem at a 2-minute sampling interval from our ground radiation reference station in Florianópolis, SC
- Qualification, storage and distribution of ground radiation data will be made by LABSOLAR

## **Derive Surface Radiation Data by Radiation Model**

- The BRAZIL-SR radiation model will be employed on a routine basis to derive surface radiation data for SW-global, SW-diffuse, and photosynthetically active radiation.
- Model radiation data will be generated and distributed by INPE

## **Radiation Model Validation**

- Several radiation model validation will be performed during LBA by using the ground data provided by this project and also by using the infra-structure available by other LBA projects
- A study on ground data interpolation versus satellite predictions will be a by-product of this work
- By now, four radiation model groups agreed to participate in this validation experiment: the INPE/UFSC/GKSS (Enio, Colle, etc.), the SUNY (Perez and colab.), The Albany (Pinker and colab.) and the NREL (Renee crew) groups.

## **Parameterization of the Aerosol in Model Predictions**

- The strong influence of aerosols from burning of the biomass during the dry season will be studied in order to implement radiation models to take this effect into account
- This will be made by using sunphotometric data (both existing, and to be implemented by this project), and also field measurements in airborne missions

# Ground Stations

