

VI FÓRUM CHINA-AMÉRICA LATINA DE INOVAÇÃO E TECNOLOGIA
I SIMPÓSIO INTERNACIONAL DE INOVAÇÃO DO CEARÁ


Master of Science in Applied Physical Science

Mestrado Acadêmico em Ciências Físicas Aplicadas (MACFA)

<http://www.uece.br/macfa>



Introduction

- Semiarid region + Wind energy + Solar energy = Applied Physical science
 - Two lines of research: **Atmospheric Physics + Energy and Environment**
 - Academic personnel: 17 professors (14 permanent + 3 collaborators)
 - Alumni: 120 masters, since August 2005
 - Enrolled students: 19 (annual student selection)
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Laboratories used for scientific research (1)

1. LAB-CLIMA – Climatology laboratory

- Mesoscale modeling;
- Climate modeling.


2. LACEEMA – Energy Conversion and Atmospheric Emissions Laboratory

- Catalytic combustion in porous media;
- Biogas production via anaerobic fermentation of regional biomasses;
- Vehicle emission modeling;
- Vehicle emission measurement via embedded systems;
- Air quality monitoring;
- Life cycle assessment of energy systems.

3. LAPA – Atmospheric Research Laboratory

- Atmospheric physics – measurements and modeling;
- Local circulation modeling – sea/land breezes, urban heat island;
- Atmospheric modeling;
- Climate modeling.

4. LAPIS – Research and Teaching Support Laboratory

- Atmospheric Physics;
 - Remote sensing;
 - Climate studies;
 - Cloud Microphysics;
 - Numerical modeling.
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Laboratories used for scientific research (2)

5. LBR – Breath Biophysics Laboratory

- Biological systems modeling;
- Biomedical engineering;
- Energies;
- Transport and air pollution.

6. LER – Renewable Energy Laboratory

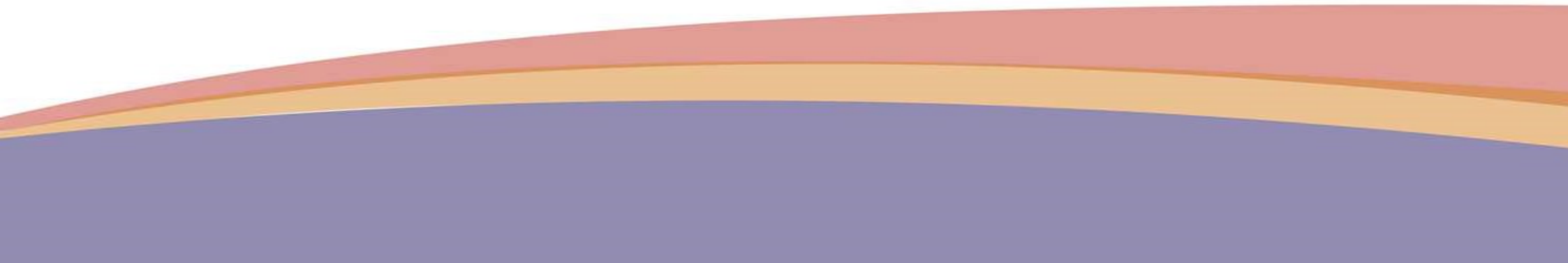
- Photovoltaic systems;
- Energy cogeneration;
- Industrial combustion;
- Ammonia production via renewable energy;
- Solar-Wind Hydrogen Production.

7. LIMMA – Integrated Laboratory of Micrometeorology and Atmospheric Modeling

- Atmospheric modeling;
- Micrometeorology;
- Microphysics of clouds;

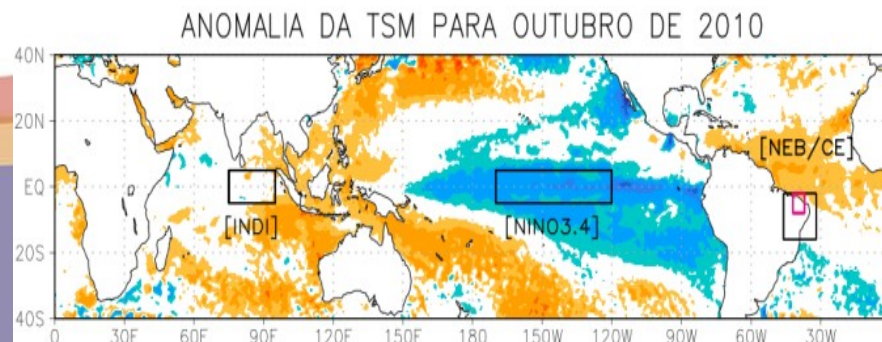
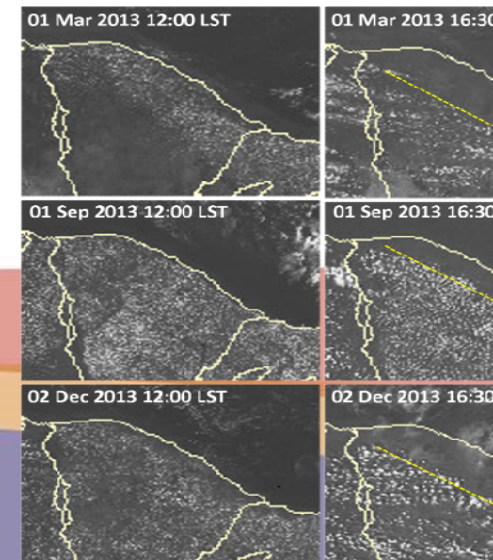
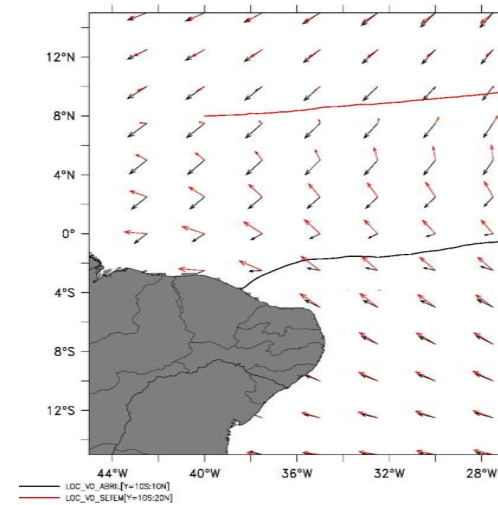
8. L-SACI – Laboratory for Studies of Aerosol and Cloud Interactions

- Development of cloud microphysics models;
- Numerical studies of aerosols and cloud properties;
- Aerosol measures;
- Development of Cloud Property Measurement Instruments.



Projects and Studies of Atmospheric Physics

- Observational and modeling studies of renewable energy as based in atmospheric variables (wind, solar radiation) in northeastern Brazil
- Studies of climate variability at multiple scales and their impacts in Northeast Brazil: Observations and modeling
- Impact studies of the Pacific and Atlantic oceans on climate variability in Northeast Brazil: Emphasis on agricultural activities and water demand and supply
- Climatic diagnostic studies with emphasis on atmospheric variables observed in Northeast Brazil and its possible scenarios in relation the climate change
- Microphysical measures and modeling studies of atmospheric aerosols and its influence on weather and climate conditions in Northeast Brazil.



Projects of Energy and Environment

1. Protection of photovoltaic systems against atmospheric discharge
2. Efficiencies comparison among photovoltaic systems in Brazil
3. Study of varied effects on the efficiency of photovoltaic system
4. Assessment of the exceeding wind energy um the Brazilian northeast region to produce nitrogen fertilizer
5. In field performance analysis of the photovoltaic solar tree installed at UECE's Itaperi Campus.

