

ATMOSPHERIC RESEARCH (ATM-RES)

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In the present context of global changes, atmospheric and climatic research should be more organized in the framework of international collaborations and research networks. During recent years, the importance of systematic monitoring of the atmospheric structure, dynamics and composition has been confirmed by numerous satellite and surface observations. Together with land use change, the aerosol burden perturbs the surface/atmosphere radiative balance, as well as cloud properties, ensuing regional climatic impacts. Over Southern Africa and the neighboring oceanic regions of the Indian Ocean, these regional impacts are influenced by dynamical variability and play an important role in global climate change. The quantitative characterization of these anthropogenic regional factors and their relative climatic impact are still uncertain. In this domain, the improvement and the use of integrative climate modeling tools is a necessity for environmental management and climate change mitigation (International Panel on Climate Change, 2007). Compared to developed regions of the northern hemisphere, the tropical and austral regions of the southern hemisphere are poorly documented even though they are important components of the global atmosphere. Thus, it is important to understand the structure and dynamics of the atmosphere (especially in Southern Africa, see also national DST 10 years grand challenges).

The present research team at UKZN consists of 1 Associate Professor, 1 Scientist (SANSA), 2 Post-Doctoral Researchers, 6 Ph.D and 4 Master Degree students.

The research team is focused on

- Studies on middle atmospheric thermal structure
- Studies on atmospheric gravity waves, planetary waves, equatorial waves, tides and etc.,
- Aerosols and clouds
- Mesosphere Lower Thermosphere (MLT) interactions and Stratosphere-troposphere exchange (STE)
- Different ground and space borne atmospheric remote sensing techniques
- Atmospheric pollution and its impact
- Different atmospheric forces
- Model/Simulation and Climate trends

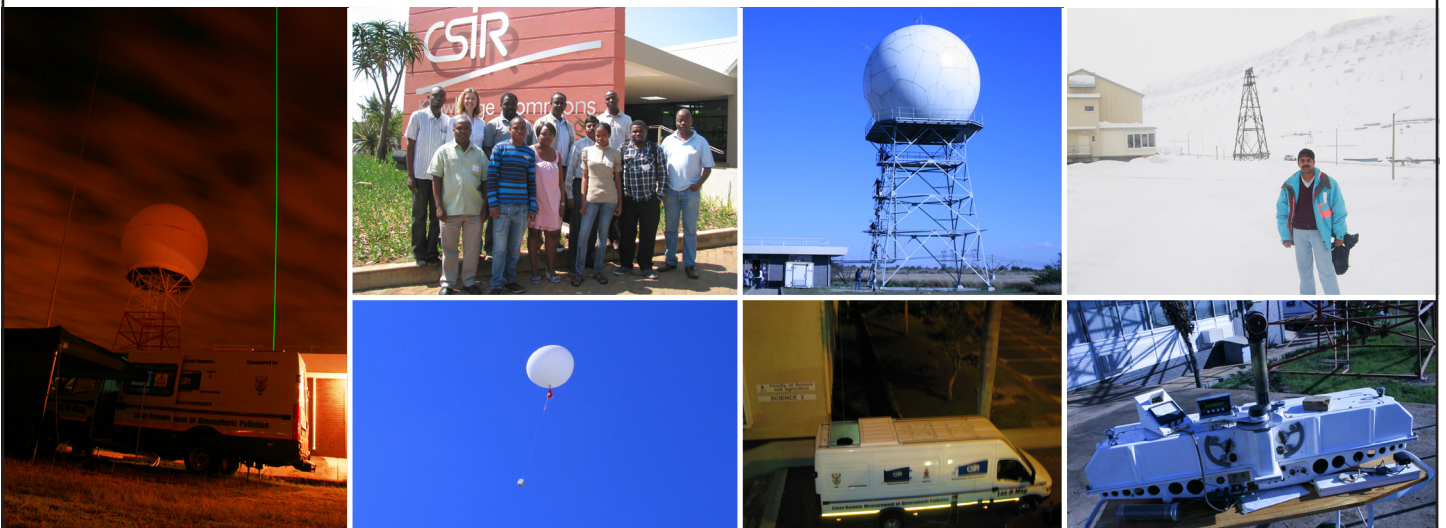
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Instruments

| GROUND BASED (REMOTE SENSING) | SPACE BORNE (SATELLITE OBSERVATIONS) |
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| Light Detection and Ranging (LIDAR) | Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) |
| Radio Detection and Ranging (RADAR) (including SUPERDARN HF radar network) | Total Ozone Mapping Spectrometer (TOMS) and Global Ozone Monitoring Experiment (GOME) |
| Sun Photometer : AErosol RObotic NETwork (AERONET) | Moderate Resolution Imaging Spectro-Radiometer (MODIS) and Multi-angle Imaging Spectro-Radiometer (MISR) |
| Radiometer | Halogen Occultation Experiment (HALOE) |
| Ozone spectral analyzer (including SAOZ) | Formosa Satellite 3 - Constellation Observing System for Meteorology, Ionosphere, and Climate (FORMOSAT-3/ COSMIC) |
| Radiosonde / Ozonesonde | Measurement of Ozone and Water Vapour on Airbus in-service Aircraft (MOZAIC) |
| South African Weather Service data | Meteorological Satellite (EU-METEOSAT-3) |
| Riometer (South African National Antarctic Programme: SANAP) | Stratospheric Aerosol and Gas Experiment (SAGE) |

The present research team collaborators are

| NATIONAL | INTERNATIONAL |
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| Council for Scientific and Industrial Research | Université de la Réunion, Laboratoire de l'Atmosphère et des Cyclones (LACy, UMR 8105), CNRS – Reunion (France) |
| South African Weather Service | Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS: UMR8190), CNRS - France |
| South African National Space Agency | Laboratoire d'Aérodologie, Toulouse, France |
| South African Maritime Safety Authority | Laboratoire Interuniversitaire des Systèmes Atmosphériques (LISA, UMR 7583, CNRS) |
| University of Pretoria | Universite Antananrivo, Madagascar |
| North-West University | Lindenberg Meteorological Observatory, Germany |
| African Laser Centre | Centre Algérien de Développement des Technologies Avancées, Algeria |
| | Addis Ababa University, Ethiopia |



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