Plan for lidar-related research in Africa extends to atmosphere

Researchers from South Africa, France, Ethiopia and Reunion gathered at the Innovation Hub recently to work out the details of a plan to use lidar technology in an African atmospheric research project. The researchers were led by Dr Sivakumar Venkataraman of the CSIR (middle row, third from the left), Dr Gizaw Mengistu of the Addis Ababa University (front, right), Professor Hassan Bencherif of the Université de la Réunion (front, third from the left), and Dr Philippe Keckhut of CNRS, France

South Africa, Ethiopia and France are planning to put forward their top scientists in a project to use light detection and ranging (lidar) technology for atmospheric research over Africa.

With lidar, short wavelengths of the electromagnetic spectrum are used. Because one can generally image an object about the same size as the wavelength, lidar is very sensitive to aerosols and cloud particles - with obvious applications in atmospheric and environmental research. Laser systems were deployed for atmospheric studies immediately after the discovery of the laser in 1960 and has advanced significantly since then. To date, however, no significant atmospheric research project has been undertaken using African-developed lidar technology.

Dr Sivakumar Venkataraman of the CSIR National Laser Centre says the planned collaboration between the countries stems from the respective strengths of the players. "French scientists at the Centre National de la Reserche Scientifique (CNRS) have more than 27 years' experience in using lidar technologies. They are clearly world leaders and we stand to gain much from these planned interactions," he says. South Africa has two lidar systems: one at the University of KwaZulu-Natal (UKZN) in Durban and a mobile lidar system, which the CSIR is set to complete in March next year. "Naturally we are very keen to analyse data already obtained from the UKZN lidar, and data that will be obtained by the new mobile laser system," he says. While Ethiopia does not have a lidar system, researchers plan to use South Africa's mobile system in that country. A good working relationship exists between physicists at the CSIR and at the Addis Ababa University in Ethiopia.

"The recent meeting has left us excited and inspired to get a research project off the ground as soon as possible. It has the potential of being truly collaborative, with possible participation by numerous South African universities (with the advantage of postgraduate students participating), as well as organisations such as the Hermanus Magnetic Observatory and the South African Weather Service," says Venkataraman.

"A significant area of African skies can be covered with lidars at Durban, Reunion and Addis Ababa as well as putting the South African mobile lidar to work," he says. The researchers will, in coming weeks, formalise a potential research proposal and plan for submission to the forth-coming European Union Framework Programme 7.