LSGI Distinguished Lecture Series
"Fengyun Meteorological Satellites: Achievements and Applications" and "Remote Sensing of Atmospheric Water Vapor Using Multi-instrument on board Fengyun Neteorological Satellite Series"

Overview

It was our pleasure to invite Prof. Hu Xiuqing, deputy chief designer of ground application systems of Fengyun-3 (FY-3) satellite, a science and technology leader appointed by the China Meteorological Administration, and Vice Chairman of WMO / GSICS Research Group, to deliver two seminars of the LSGI Distinguished Lecture Series on 3 January 2017.

Dr. Hu Xiuqing, Professor, China Meteorological Administration, is the deputy chief designer of ground application systems of Fengyun-3 (FY-3) satellite, a science and technology leader appointed by the China Meteorological Administration, and Vice Chairman of WMO / GSICS Research Group. He was the director of the calibration and pre-processing system for the FY-3 and FY-4 satellites, and served as the principal scientist for the medium resolution spectral imager (MERSI).

Dr. Hu has been engaged in the research on the radiometric calibration of meteorological satellite remote sensors. He and his team have established a wide range of calibration methods for optical sensors of FY satellites. He has developed algorithms for many satellite remote sensing products, such as dust storms, aerosols and water vapor, etc., and established China's first Dust storm Remote sensing monitoring AlGorIthm (DRAGI) for stationary meteorological satellite, which played a important role in terms of dust storm forecast and monitoring. He has developed the core algorithm for the operational preprocessing system of FY-3/MERSI, proposed a number of improvements and proposals for the meteorological instrument design, and proposed a wide dynamic non-linear radiometric calibration model.

He has been a Principal Investigator (PI) or Co-PI of more than 40 projects, including the FY satellite engineering program and national research projects. He is an author of 100 technical papers, and was a recipient of two national awards and others.

"Fengyun Meteorological Satellites: Achievements and Applications"

With great efforts in the past 40 years, Chinese Fengyun (FY) meteorological satellites have formed two constellation systems, i.e. polar orbit and geostationary orbit. China's meteorological satellite observation network has been established by combining the polar orbiting satellites and geostationary ones. They can operationally provide accurate meteorological and climate observations and forecasts globally at long-term and short-term scales. Fengyun meteorological satellite series are the most widely used ones that produce the largest benefit among China's civil remote sensing satellites. Fengyun satellites have been adopted by the World Meteorological Organization (WMO) for operational meteorological services.

This talk has provided a comprehensive overview of the development and future planning of FY meteorological satellites, with an emphasis on their applications in different areas and their application status around the world.

"Remote sensing of atmospheric water vapor using Multi-instrument on board Fengyun meteorological satellite series"

Water vapor is an important component of the atmosphere and it can be solid, liquid or gaseous in the atmosphere, generating clouds, fog, snow and rain. In addition, it is an important greenhouse gas, and the change of its phase plays an important role in the heat exchange of the atmosphere. Hence, good acknowledgement of atmospheric water vapor is important in weather forecasting as well as climate change studies. Different sensors can be used for water vapor remote sensing on board FY-3 meteorological satellite, i.e., the most mature infrared (IR) and microwave (MW) instruments, near infrared (NIR) instrument, and GNSS instrument using occultation technology which was first used on board FY-3C. These different water vapor instruments have their own advantages, but also have their own limitations. In this talk, the capability of FY-3 to detect global atmospheric water vapor using near-infrared, thermal infrared, microwave and GNSS occultation techniques and how they complement each other will be discussed, providing an opportunity to remote sense water vapor using different instruments in combination in the future.