Microwave Remote Sensing of Land Surface Properties: from Modeling to Observations

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Abstract

Highly accurate observations at various scales on the land surface are urgently needed for the studies of many areas, such as hydrology, meteorology and agriculture. With the rapid development of remote sensing techniques, remote sensing now has the capacity of monitoring many factors of the Earth land surface. This is especially true for the space-borne microwave remote sensing systems. They have been widely used in the quantitative monitoring of global snow, soil moisture and vegetation parameters with their all-weather, all-time observation capabilities and their sensitivities to the characteristics of land surface factors. Based on electromagnetic theories and microwave radiative transfer equations, researchers have achieved great successes in the microwave remote sensing studies for different sensors in recent years. This talk will systematically review the progresses on five research areas including microwave theoretical modelling, microwave inversion on soil moisture, snow, vegetation and land surface temperatures. With the further enrichment of remote sensing datasets and the development of remote sensing theories and inversion techniques, remote sensing, including microwave remote sensing, will play a more important role in the studies and applications of the Earth systems.

Regional Speaker: Mandarin Chinese; English

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Dr. Jiancheng Shi received his B.A. from the University of Lanzhou in China, and his M.A. and Ph.D. degrees in Geography from the University of California, Santa Barbara (UCSB) in 1982, 1987, and 1991, respectively. He then worked the Earth Research Institute at UCSB as a research scientist. Since 2010, he has joined the Institute of Remote Sensing and Digital Earth in Beijing, China as a director of State Key Laboratory for Remote Sensing Science (e-mail: shijc@radi.ac.cn). He is a Fellow of IEEE and an associate editor for Geoscience and Remote Sensing Letter.

Dr. Shi has wide research interests in remote sensing technologies, especially in microwave remote sensing in both active and passive techniques and its applications in hydrology and climatic change, including: 1) microwave modeling of snow, soil, and vegetation properties; especially by using state-art the theoretical microwave scattering and emission models to

develop the simple, fast, and accurate parameterized microwave models for snow, vegetation, and rough surfaces，2) development of theory and novel inversion techniques for active and passive microwave remote sensing of soil moisture, snow and vegetation physical properties，3) applications of remote sensing data in water cycle and climatic change studies. He has published more than 280 journal and conference papers that related to above research topics.