香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

SEMINAR

BOUNDARY LAYER DYNAMIC PARAMETER GROUND-BASED REMOTE SENSING INVERSION AND CONVECTION MONITORING AND WARNING APPLICATION

Speaker

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Abstract

The favorable boundary layer thermodynamic conditions prior to convective cloud triggering are an important prerequisite for the triggering of severe weather. Most previous studies have been based on traditional observation and analysis data such as weather radar, sounding, and reanalysis. With the continuous innovation of atmospheric detection methods, traditional observation methods are no longer sufficient to meet the needs of continuous observation in time and space. New observation methods such as wind profile radar, microwave radiometer, and cloud radar have the advantages of high automation, dense spatial distribution, and high temporal resolution, which are more conducive to in-depth analysis of the triggering and subsequent development processes of severe storm clouds. Therefore, this report will start from the forefront of boundary layer meteorology and aim at the difficulties in monitoring and warning of convective triggering. By using the dense wind profile radar and cloud radar network observation data in eastern China and combining with the static meteorological satellite cloud image, the boundary layer dynamic profile triangle algorithm will be proposed, and dynamic profile products will be developed to reveal the pre-convective signals, analyze the boundary layer-cloud coupling process, and clarify the unique role of the boundary layer thermodynamic profile products in convective triggering and short-term warning.

Biography

Guo Jianping is a second-level researcher and doctoral supervisor at the Chinese Academy of Meteorological Sciences. His research focuses on boundary layer meteorology, convection triggering mechanisms, aerosol-cloud-precipitation interactions, and other areas. He is a recipient of the National Outstanding Youth Science Fund (2023), a participant in the National High-level Youth Talent Plan (2019), a leading talent in meteorology at the China Meteorological Administration, and has been listed as one of the top 2% scientists in the world by Stanford University. He is also a highly cited scientist according to Clarivate Analytics (2023) and has been listed as a highly cited scholar in atmospheric science by Elsevier for three consecutive years since 2020. He is currently the associate editor of Geophysical Research Letters and a member of the editorial board of the European Research Council of the Royal Society of Physics. He has led several national key research and development programs and major projects supported by the National Natural Science Foundation of China, published more than 200 SCI papers, and has been cited more than 10,000 times on Google Scholar. His research on boundary layer meteorology and turbulence has strongly supported national meteorological monitoring and warning services, major events such as the Olympics, Asian Games, and the National People's Congress, as well as national defense meteorological science and technology.

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