THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

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

SEMINAR

CLIMATE INTERVENTION THROUGH SOLAR RADIATION MANAGEMENT: IMPORTANCE OF SIZE-RESOLVED PARTICLE MICROPHYSICS AND PROCESS-LEVEL UNDERSTANDING

Speaker

Prof. Fangqun Yu
The State University of New York
Atmospheric Sciences Research Center
Albany, United States

Abstract

To respond to the ongoing climate crisis, the top priority is to rapidly reduce emissions of carbon dioxide and other greenhouse gases, which are the root drivers of global warming. Nevertheless, because of the challenges of cutting emissions at adequate rates and the long lifetime of greenhouse gases, it is necessary to understand the full range of options available for protecting the safety of human and natural systems. Solar radiation modification/management (SRM) has received increasing attention as a transitionary tool to try and limit the global surface temperature increase below 1.5 °C and to buy time for carbon emission reduction and removal. In the first part of this task, I will describe SRM and the potential risks associated with it. The second part will focus on stratospheric aerosol injection (SAI), one of the most promising SRM approaches. I will present the application of nucleation schemes and a sized-resolved (sectional) advanced particle microphysics (APM) model developed in our group to address SAI issues, and show the importance of accurate representation of size-resolved particle microphysics and sub-grid plume scale process-level understanding. Finally, I will discuss future research needs and engineering challenges of SAI.

Biography

Dr. Fangqun Yu has been a tenured faculty member and research professor at the State University of New York at Albany. He got his bachelor's and master's degrees from Peking University (1991) and the Chinese Academy of Sciences (1994) and earned his Ph.D. in Atmospheric Sciences from the University of California at Los Angeles (1998). Dr. Yu's research focuses on the fundamental theory of nucleation mechanisms, the development and application of nucleation and advanced particle microphysics (APM) models, the regional and global simulations of size-resolved particle microphysical processes, and the climatic and environmental impacts of atmospheric particles. Current research projects include the health effects of ultrafine particles and co-pollutants, solar radiation management, and contrail formation and climate implications associated with hydrogen aviation. He has published about 160 peer-reviewed scientific journal papers with a Google Scholar h-index of 50.

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Enquiry:

Ms. Rebecca Yau
cerebeca@ust.hk