

Predictability and data assimilation of severe weather and tropical cyclones

Despite rapid advances in numerical weather prediction (NWP) models and ever increasing computational capability, our ability to accurately predict various severe weather phenomena in the short range and at the mesoscales remains limited. This talk will present an overview of recent progress in our understanding of the mesoscale predictability of various severe weather phenomena including summertime mesoscale convective systems, tropical cyclones and wintertime snowstorms using both real-data studies and idealized simulations. Despite the inherent limit of mesoscale predictability, there is still significant room for improving the practical predictability of severe weather and tropical cyclones through advanced data assimilation techniques, better use of existing or future observations, and improved forecast models. Inter-comparison and coupling of various variational and ensemble based techniques for both severe weather and tropical cyclones will also be presented.