

Students discussion abstracts

Group 1:

Anthropogenic influence on weather and climate extremes

We narrowed down the topic to the anthropogenic influence on extreme rainfall, and tried to propose a common framework on how to investigate the topic. In this framework, the most important step is to understand the environmental issue in the selected region. Since the magnitude of anthropogenic forcing will be affected by different environmental factors in each region, their influences on extreme rainfall can also be regional dependent.

Group 2:

Can global resolution LES reproduce climate change?

Yes, assuming we have infinite computation resources and human resources. At the same time, new parameterizations for other components such as human activity, ocean and chemistry models should also be developed.

Group 3:

What is needed to make a perfect prediction of a typhoon?

To predict tropical cyclones accurately, we need to improve everything: observations, data assimilation techniques, numerical models, forecast products and so on.

Group 4:

Current problems of tropical weather and prospects for the next 10 years

The cross-scale interactions between tropical convection and large-scale circulations in the tropics

might be one of the crucial problems to be solved for realizing the seamless or sub-seasonal to seasonal (S2S) predictions.

From the perspective of modelling, the improvements of cumulus parameterizations in high-resolution global circulation models (GCMs; grey-zone issue) or the explicit global cloud resolving models (GCRM) could be the keys.

The intense observation from field campaigns or satellite scans as well as better data assimilation outcomes could also

be crucial for understanding the physical processes and the validations against the model results.

With the better representation in the extended-weather background, such as Madden-Julian Oscillation (MJO),

we believe the prediction of the extreme tropical weather and the modes on longer time scales like ENSO would be improved.

Finding a way to applying machine learning to the whole issue might be an alternative solution to the expensive GCRM

Group 5:

How many satellites should be launched to advance science?

1. Higher temporal resolution of satellite observations can enhance our understanding to the fields.
2. The target temporal resolution should refer to the timescale of the particular process.
3. Meanwhile, it is also imperative to have other instruments to validate the satellite observations.