Session 2:
Extreme Events and Downscaling

2-1: Izuru TAKAYABU
Introduction of TOUGOU Theme C

- TOUGOU Theme C
  - To respond to the various demand from users, the projection data (especially focused on extreme events) have been arranged by considering its temporal and spatial scale.
- Air-Sea interaction
  - When SST pattern is changed between CMIP3/5, precipitation outputs are different in some area
  - Air-Sea interaction makes the difference between CMIP models decrease
- Potential of high resolution model (NHRCM05/02)

- HIROSHIMA heavy rainfall (Baiu heavy rainfall)
  - In the condition of instability, increase in water contents can make this event strengthen but stability and increase in water contents in future can also be offset.
- Haiyan (Typhoon)
  - Climate change can make Minimum Central Pressure and Maximum Wind Speed strengthen

2-2: Cheng-Ta CHEN

Regional Statistical Downscaling of Extreme Weather and Climate Indices

- From daily data (APHRODITE) to extreme events (5km grid)
- Procedure
  - Step1: interpolation
  - Step2: Bias-correction using Quantile-Mapping
- Quantile mapping with proper selection of data time window and number of quantile bins can effectively remove the model bias and adjust spatial scale dependence of extreme indices.
- It is needed to carefully consider whether the users have demand for these information or not.

2-3: Sachie KANADA

Impacts of SST Patterns on Rapid Intensification of Typhoon Megi (2010)

- Impacts of ocean response induced by an intense TC to the TC:
  - Inner-core structures
  - Convective activity
  - Rapidly intensification (onset timings and rates)
- 3 sensitives experiments
  - 3dO (3D AO coupled model), FO (non-coupled model) and 1dO (1D slab model)
- Results

1. Only the 3dO successfully simulates the intensity of Typhoon Megi
2. Impacts of ocean responses are the most obvious in the rapid intensification
3. Convective activity shows a close relationship with radial profiles of SST

2-4: Yasutaka WAKAZUKI

Initial Bubble for Idealized Simulations of Cumulus Convections

- Focused on methods of idealized experiments of meso convective precipitation systems with respect to environment
- Meso-γ
  - Air-Lifting-Blending (ALB) methods can reproduce a cumulus convection with less initial heating in more realistic condition compared with the conventional Warm Bubble method.
- Meso-α
  - The idealized front environment is created by functions with 16 parameters
- The sensitivity tests with respect to global warming environments will be performed as future work