

This dataset contains 6-hourly model output from 1) the Control experiment, which is integrated for two years; 2) 1°C experiments where the magnitude of the SST perturbation is 1°C; 3) 2°C experiments where the magnitude of the SST perturbation is 2°C and 4) 5°C experiments where the magnitude of the SST perturbation is 5°C.

The horizontal resolution is the data is 6°-longitude by 6°-latitude. The vertical resolution is 50hPa. The temporal resolution is 6 hours.

In the 1 (2, 5) °C experiments, there are 3 sets of experiments, namely Aspect1, Aspect3 and Aspect 5 experiments which indicate the spatial scale of the SST perturbation. Take the 1°C-Aspect1 experiment for example, it consists of 20 ensemble experiments, each initiated on day 260, 260.5, 261, 261.5 269.5 of the Control experiment and is integrated until day 350.

We include the dynamical (e.g., wind speed, moisture, temperature), precipitation and surface evaporation fields for the Control experiment and 2°C -Aspect3 experiments, which are the focus of the paper.

We also include U200hPa, precipitation fields for the other two perturbation experiments.

%To read the dynamical field of the Control experiment between day 260.25 and 350, use Matlab command as below:

```
a = importdata('Control_dynamic_day260p25_350.dat');

lon = a.lon; % longitude from 3°E, 9°E to 357°E (3°E), resolution is 6° longitude

lat = a.lat; % latitude from -87°N (87°S) to 87°N, resolution is 6° latitude

p = a.p; % pressure level from 50hPa to 1000hPa, resolution of 50 hPa.

u = a.u; %zonal velocity (m/s) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)

v = a.v; % meridional velocity (m/s) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)

T = a.T; % temperature (Kelvin) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)

q = a.q; % specific humidity (kg/kg) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)
```

%To read the precipitation field of the Control experiment in the first year, use Matlab command as below:

```
a = importdata('Control_prec_year1.dat');

lon = a.lon; % longitude from 3°E, 9°E to 357°E (3°E), resolution is 6° longitude

lat = a.lat; % latitude from -87°N (87°S) to 87°N, resolution is 6° latitude

prec = a.prec; % integrated precipitation in the past 6 hours (mm). % (longitude,latitude,time),
(60, 30, 365*4).

%To get day 1 total precipitation for example

prec_day1 = sum(prec(:,:,1:4),3);
```

%To read the surface evaporation field of the Control experiment in the first year, use Matlab command as below:

```
a = importdata('Control_evap_year1.dat');

lon = a.lon; % longitude from 3°E, 9°E to 357°E (3°E), resolution is 6° longitude

lat = a.lat; % latitude from -87°N (87°S) to 87°N, resolution is 6° latitude

evap = a.evap; % integrated evaporation in the past 6 hours (mm). % (longitude,latitude,time),
(60, 30, 365*4).

%To get day 1 total evaporation for example

evap_day1 = sum(evap(:,:,1:4),3);
```

% To get the dynamical field in the 2°C-Aspect3-ens1 for example,

```
a = importdata('2K_Aspect3_dynamic_ens1.dat');

lon = a.lon; % longitude from 3°E, 9°E to 357°E (3°E), resolution is 6° longitude
```

```
lat = a.lat; % latitude from -87°N (87°S) to 87°N, resolution is 6° latitude
```

```
p = a.p; % pressure level from 50hPa to 1000hPa, resolution of 50 hPa.
```

```
u = a.u; %zonal velocity (m/s) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360) %because ens1 is integrated from day 260 to 350, 4*(350 - 260) = 360;
```

```
v = a.v; % meridional velocity (m/s) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)
```

```
T = a.T; % temperature (Kelvin) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)
```

```
q = a.q; % specific humidity (kg/kg) %dimension (longitude,latitude,pressure,time) (60, 30, 20, 360)
```

%To read the precipitation field of the 2°C-Aspect3-ens1 experiment, use Matlab command as below:

```
a = importdata('2K_Aspect3_prec_ens1.dat');
```

```
lon = a.lon; % longitude from 3°E, 9°E to 357°E (3°E), resolution is 6° longitude
```

```
lat = a.lat; % latitude from -87°N (87°S) to 87°N, resolution is 6° latitude
```

```
prec = a.prec; % integrated precipitation in the past 6 hours (mm). % (longitude,latitude,time), (60, 30, 365*4).
```

%To get day 1 total precipitation for example

```
prec_day1 = sum(prec(:,:,1:4),3);
```