

# IPCC AR4預測台灣未來夏季氣候 之變化特性與機制

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## Goals:

- To evaluate the significance of IPCC regional climate-change information in Taiwan
- To diagnose characteristics and physical processes for this regional climate change

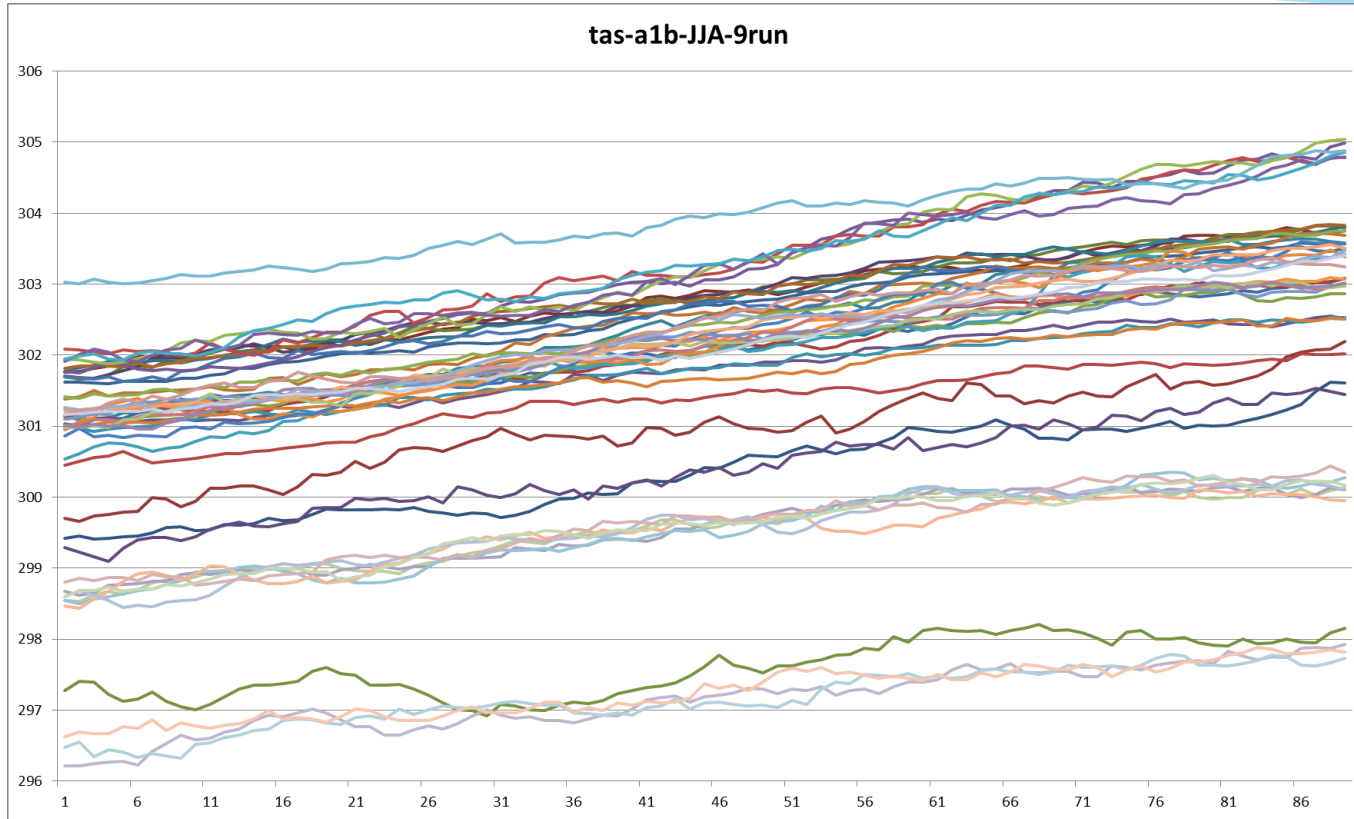
Variables: surface temperature ( $T_s$ ), precipitation ( $Pr$ )

Seasons: JJA

## Approaches:

1. get the area-mean Pr and Tas time series (20-25N, 120-125E)
2. To diagnose interdecadal change via the 9-yr-running-mean field
3. apply student-t test for the running-mean time series using the effective degrees of freedom

# Tas (JJA)





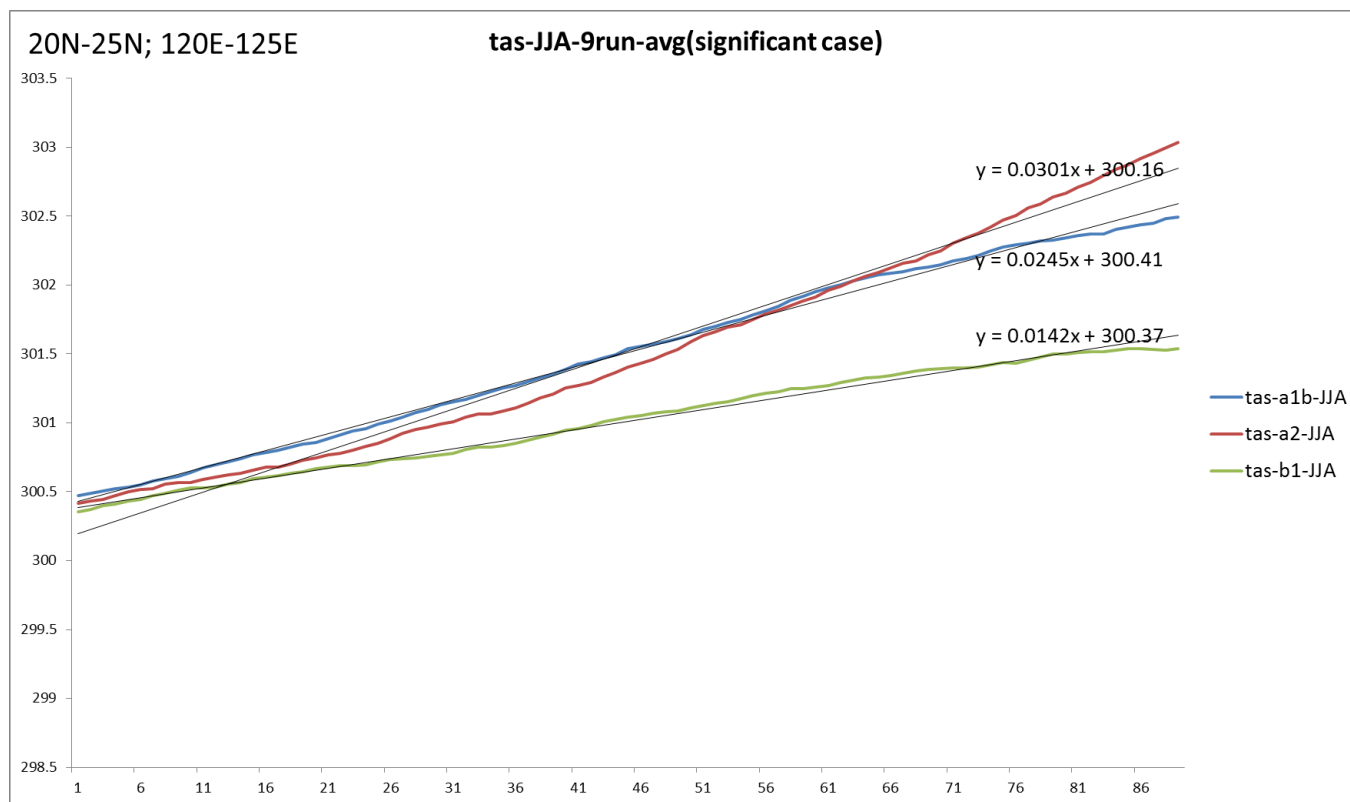
| a1b-1as-JJA      |   |                 | slope  | t-value  | EDF     | 0.0500 | 0.0250 | 0.0050 |
|------------------|---|-----------------|--------|----------|---------|--------|--------|--------|
| bccr_bcm2_0      | 1 | 2000/01~2099/12 | 2.3962 | 18.8890  | 4.6123  | 2.132  | 2.776  | 4.604  |
| ccma_cgcm3_1     | 1 | 2000/12~2100/11 | 2.3742 | 14.0560  | 11.6261 | 1.796  | 2.201  | 3.106  |
|                  | 2 |                 | 2.1777 | 127.7640 | 5.1688  | 2.015  | 2.571  | 4.032  |
|                  | 3 |                 | 2.6919 | 69.3720  | 3.3783  | 2.353  | 3.182  | 5.841  |
|                  | 4 |                 | 2.3948 | 81.9310  | 3.8452  | 2.353  | 3.182  | 5.841  |
|                  | 5 |                 | 2.3654 | 22.2400  | 3.3363  | 2.353  | 3.182  | 5.841  |
| ccma_cgcm3_1_t63 | 1 | 2000/12~2100/11 | 2.4801 | 88.3780  | 6.8518  | 1.943  | 2.447  | 3.707  |
| cnrm_cm3         | 1 | 2000/01~2209/12 | 2.4086 | 39.5550  | 2.8456  | 2.92   | 4.303  | 9.925  |
| csiro_mk3_0      | 1 | 2000/09~2200/08 | 1.3005 | 15.6650  | 6.9787  | 1.943  | 2.447  | 3.707  |
| csiro_mk3_5      | 1 | 2000/09~2100/08 | 7.3780 | 68.7730  | 2.5708  | 2.92   | 4.303  | 9.925  |
| gfdl_cm2_0       | 1 | 2001/01~2200/12 | 3.1832 | 81.3980  | 3.0484  | 2.353  | 3.182  | 5.841  |
| gfdl_cm2_1       | 1 | 2001/01~2200/12 | 2.8575 | 81.2670  | 5.6232  | 2.015  | 2.571  | 4.032  |
| giss_model_e_h   | 1 | 2000/1~2099/12  | 3.1227 | 21.8700  | 4.8963  | 2.132  | 2.776  | 4.604  |
|                  | 2 |                 | 2.5602 | 68.1730  | 3.1105  | 2.353  | 3.182  | 5.841  |
|                  | 3 |                 | 2.2502 | 29.1010  | 3.5726  | 2.353  | 3.182  | 5.841  |
| iap_fgoals1_0_g  | 1 | 1999/12~2199/11 | 1.9874 | 28.3870  | 9.0230  | 1.833  | 2.262  | 3.25   |
|                  | 2 |                 | 1.9216 | 91.1630  | 8.0758  | 1.86   | 2.306  | 3.355  |
|                  | 3 |                 | 1.8472 | 34.2420  | 7.2239  | 1.895  | 2.365  | 3.499  |
| ingv_echam4      | 1 | 2001/01~2100/12 | 3.8367 | 27.0690  | 3.0792  | 2.353  | 3.182  | 5.841  |
| inmcm3_0         | 1 | 2001/01~2200/12 | 1.8185 | 43.6460  | 10.4642 | 1.812  | 2.228  | 3.169  |
| ipsl_cm4         | 1 | 2000/01~2100/12 | 3.2679 | 30.9690  | 3.0206  | 2.353  | 3.182  | 5.841  |
| miroc3_2_hires   | 1 | 2001/01~2100/12 | 5.5597 | 54.1310  | 3.8699  | 2.353  | 3.182  | 5.841  |
| miroc3_2_medres  | 1 | 2001/01~2300/12 | 4.3376 | 54.5610  | 2.6571  | 2.92   | 4.303  | 9.925  |
|                  | 2 | 2001/01~2100/12 | 4.0071 | 35.5480  | 2.8591  | 2.92   | 4.303  | 9.925  |
|                  | 3 |                 | 4.3009 | 74.8470  | 2.7580  | 2.92   | 4.303  | 9.925  |
| mpi_echam5       | 1 | 2001/01~2200/12 | 3.5788 | 25.4670  | 2.5533  | 2.92   | 4.303  | 9.925  |
|                  | 2 | 2001/01~2300/12 | 3.8118 | 32.5820  | 2.9590  | 2.92   | 4.303  | 9.925  |
|                  | 3 | 2001/01~2200/12 | 4.0072 | 13.5950  | 2.4932  | 2.92   | 4.303  | 9.925  |
|                  | 4 | 2001/01~2100/12 | 3.3344 | 23.2500  | 3.3817  | 2.353  | 3.182  | 5.841  |
| mri_cgcm2_3_2a   | 1 | 2000/11~2100/10 | 2.6550 | 23.1850  | 4.9852  | 2.132  | 2.776  | 4.604  |
|                  | 2 |                 | 2.1886 | 56.6890  | 4.5048  | 2.132  | 2.776  | 4.604  |
|                  | 3 |                 | 2.7390 | 73.9010  | 4.9427  | 2.132  | 2.776  | 4.604  |
|                  | 4 |                 | 2.2716 | 28.4420  | 8.0131  | 1.86   | 2.306  | 3.355  |
|                  | 5 |                 | 2.5110 | 24.9230  | 3.2294  | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3      | 1 | 2000/01~2199/11 | 3.9027 | 29.5570  | 4.1894  | 2.132  | 2.776  | 4.604  |
| miub_echo_g      | 1 | 1999/01~2298/12 | 1.9847 | 105.6050 | 2.6737  | 2.92   | 4.303  | 9.925  |
|                  | 2 | 1999/01~2198/12 | 2.4037 | 17.2620  | 4.7870  | 2.132  | 2.776  | 4.604  |
|                  | 3 |                 | 2.2110 | 22.8960  | 3.5051  | 2.353  | 3.182  | 5.841  |
| ncar_ccsm3_0     | 1 | 1999/09~2099/08 | 1.8525 | 23.8310  | 4.0881  | 2.132  | 2.776  | 4.604  |
|                  | 2 | 1999/09~2099/08 | 3.3731 | 16.0910  | 5.4010  | 2.015  | 2.571  | 4.032  |
|                  | 3 | 1999/09~2099/08 | 4.5518 | 18.0200  | 2.9097  | 2.92   | 4.303  | 9.925  |
|                  |   |                 |        |          |         |        |        |        |
|                  | 5 | 1999/09~2099/08 | 2.9770 | 16.6010  | 5.2045  | 2.015  | 2.571  | 4.032  |
|                  | 6 | 1999/09~2099/08 | 4.5211 | 18.1320  | 4.6698  | 2.132  | 2.776  | 4.604  |
|                  | 7 | 1999/09~2099/08 | 3.1285 | 13.5030  | 8.0040  | 1.86   | 2.306  | 3.355  |
|                  |   |                 |        |          |         |        |        |        |
|                  | 9 | 1999/09~2099/08 | 1.9382 | 23.1360  | 3.4553  | 2.353  | 3.182  | 5.841  |
| ncar_pcm1        | 1 | 1999/9~2099/6   | 3.5995 | 20.2400  | 3.8398  | 2.353  | 3.182  | 5.841  |
|                  | 2 | 缺               |        |          |         |        |        |        |
|                  | 3 | 1999/9~2199/8   | 1.5508 | 17.6810  | 5.3310  | 2.015  | 2.571  | 4.032  |
|                  | 4 | 1999/9~2099/8   | 3.4470 | 13.7350  | 5.9166  | 2.015  | 2.571  | 4.032  |
| ukmo_hadgem1     | 1 | 2000/01~2099/11 | 5.0164 | 31.6560  | 2.9136  | 2.92   | 4.303  | 9.925  |

## Runs with significant interdecadal variability

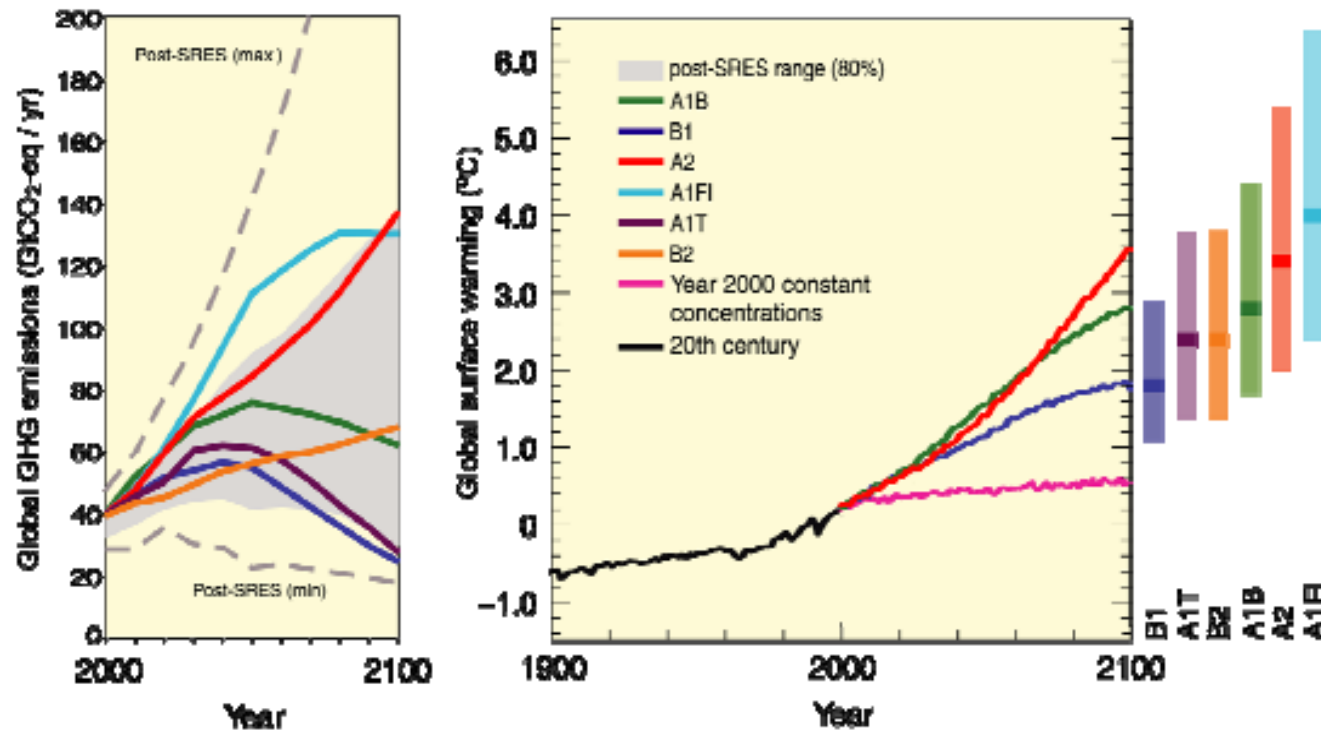
| tas | JJA         |             |             |     |
|-----|-------------|-------------|-------------|-----|
|     | a1b         | a2          | b1          | sum |
| +   | 49          | 37          | 44          | 134 |
| -   | 0           | 0           | 0           | 0   |
| sum | 49/49(100%) | 37/37(100%) | 44/44(100%) |     |

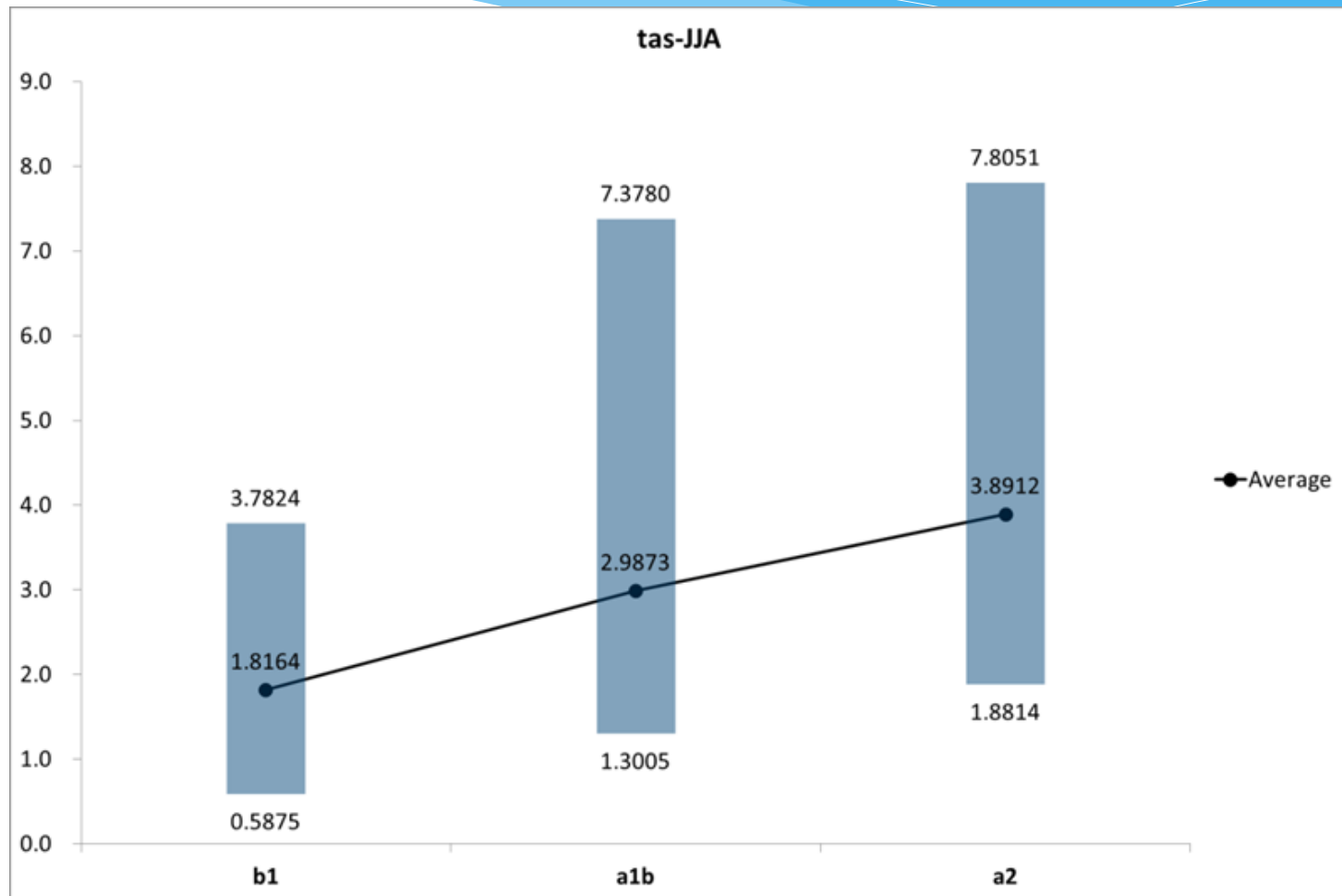
Summer T: 100% with significant warming trend

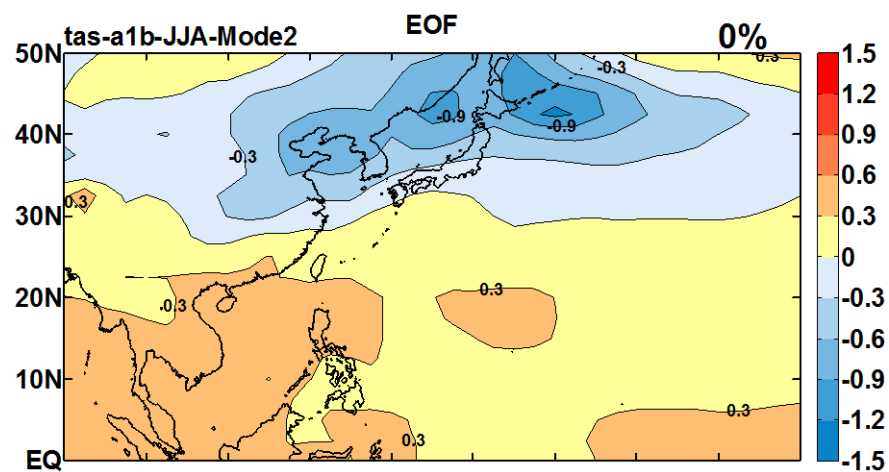
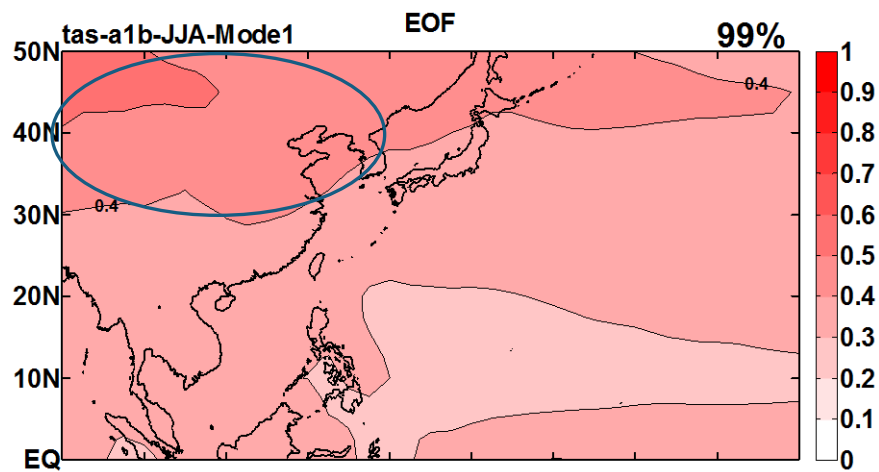
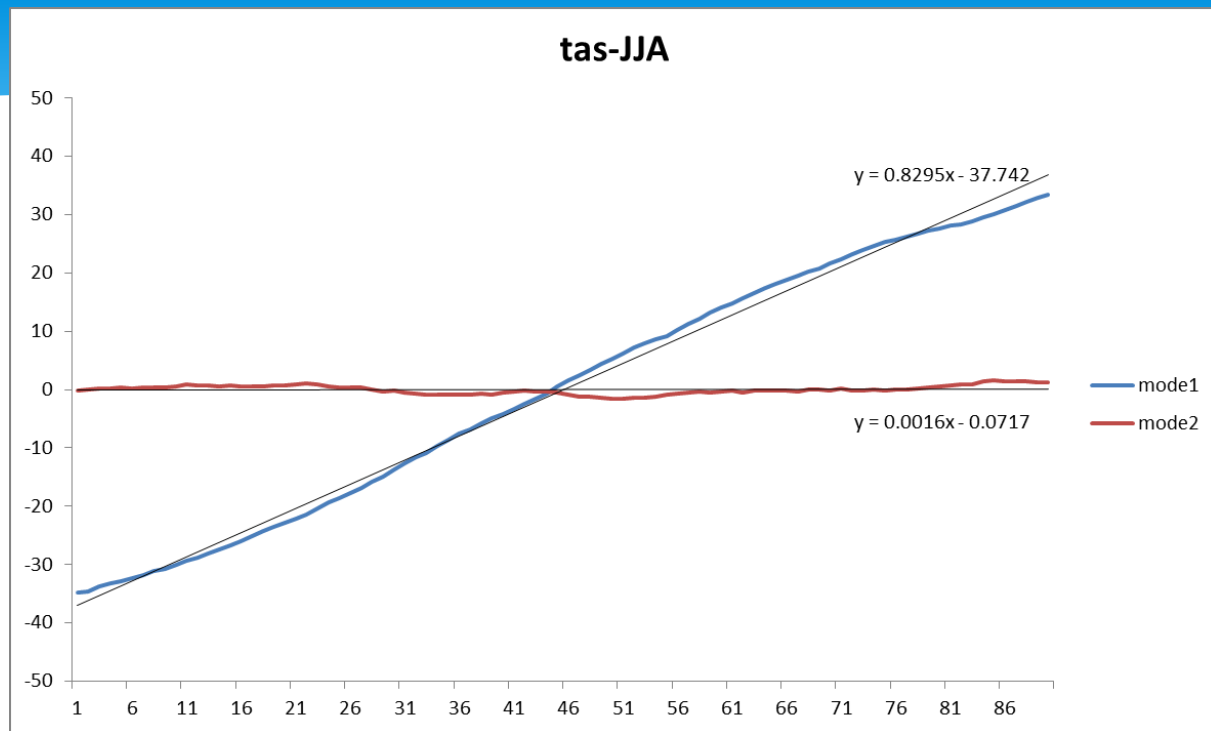
# Tas(JJA)



Scenarios for GHG emissions from 2000 to 2100 (In the absence of additional climate policies)  
and projections of surface temperatures





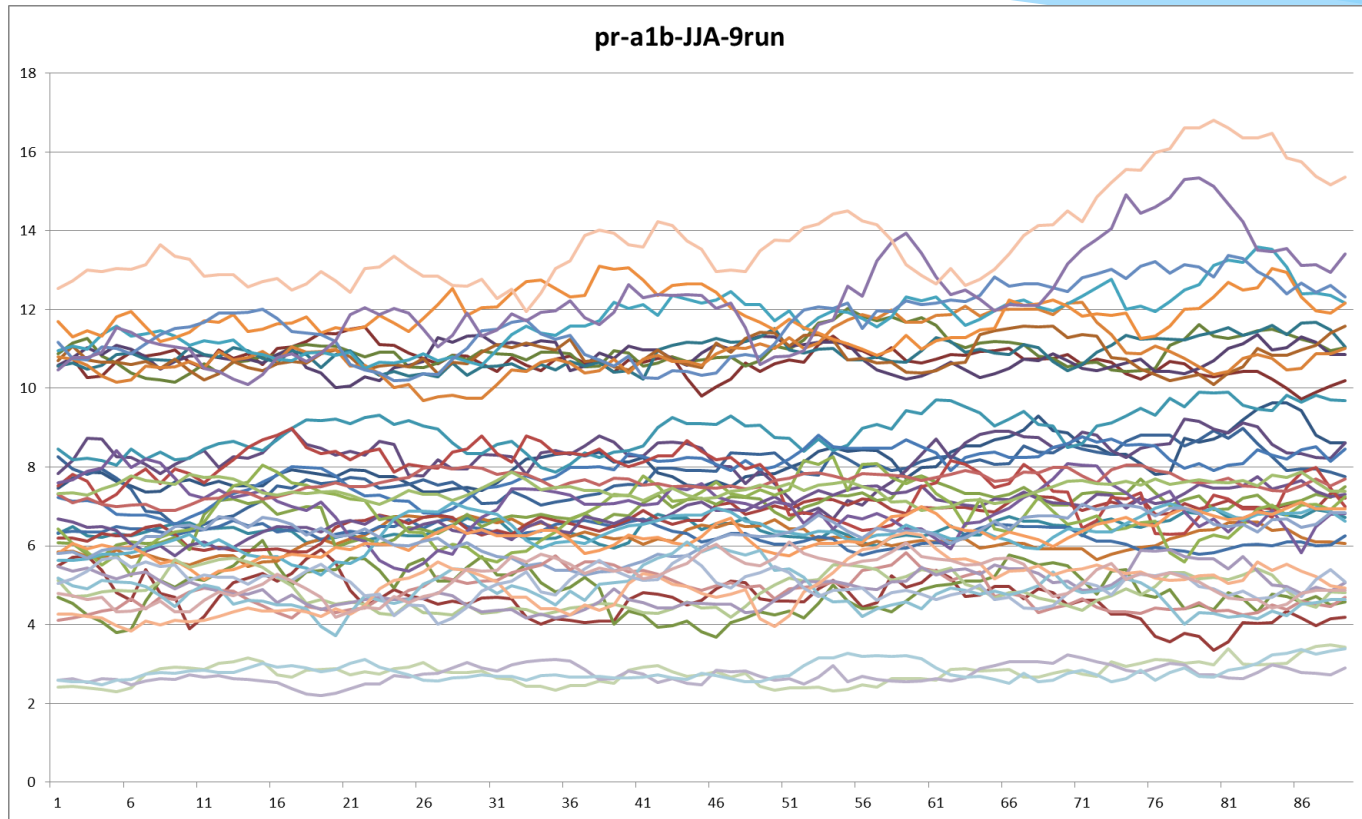


# Precipitation (Pr)

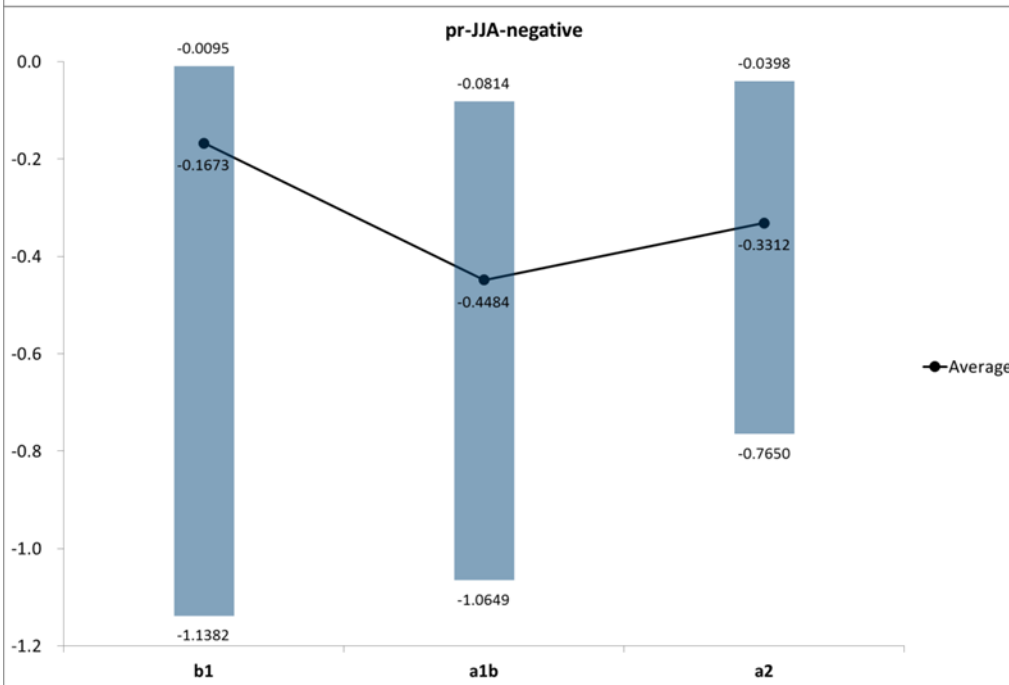
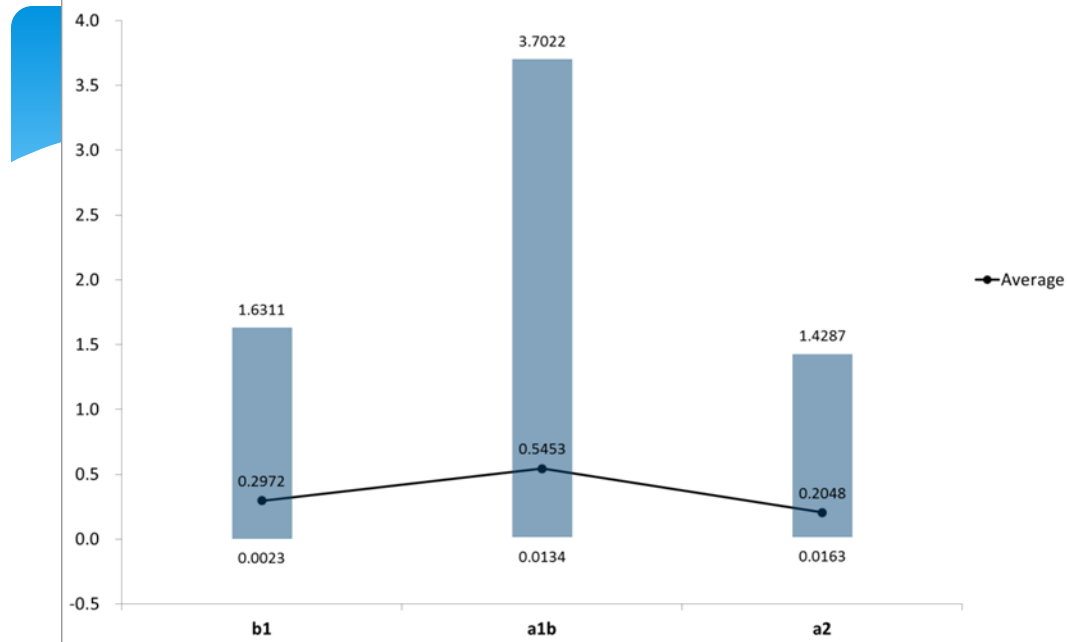
| Pr  | JJA        |            |            |     |
|-----|------------|------------|------------|-----|
|     | a1b        | a2         | b1         | sum |
| +   | 34         | 24         | 29         | 89  |
| -   | 8          | 4          | 8          | 20  |
| sum | 42/49(86%) | 28/37(76%) | 35/44(80%) |     |

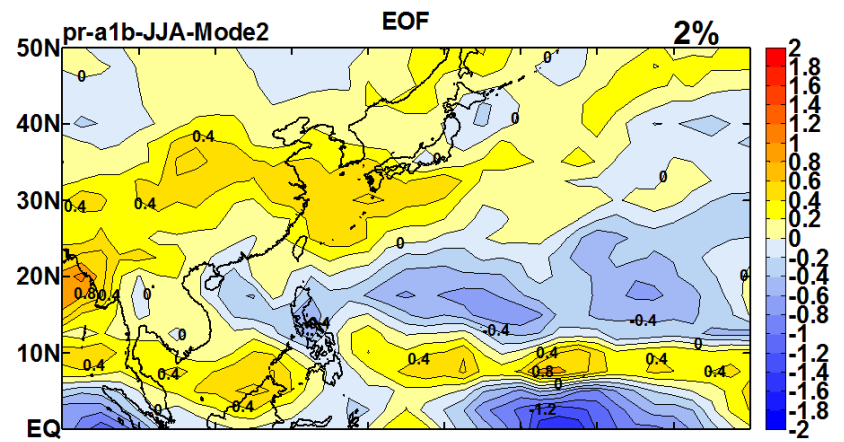
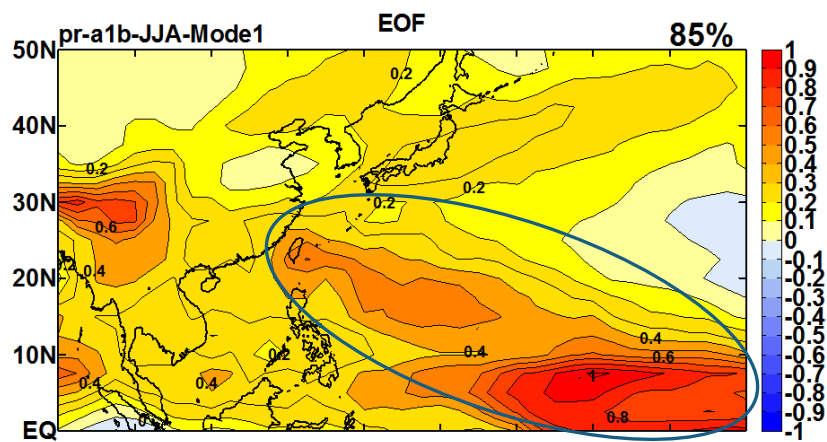
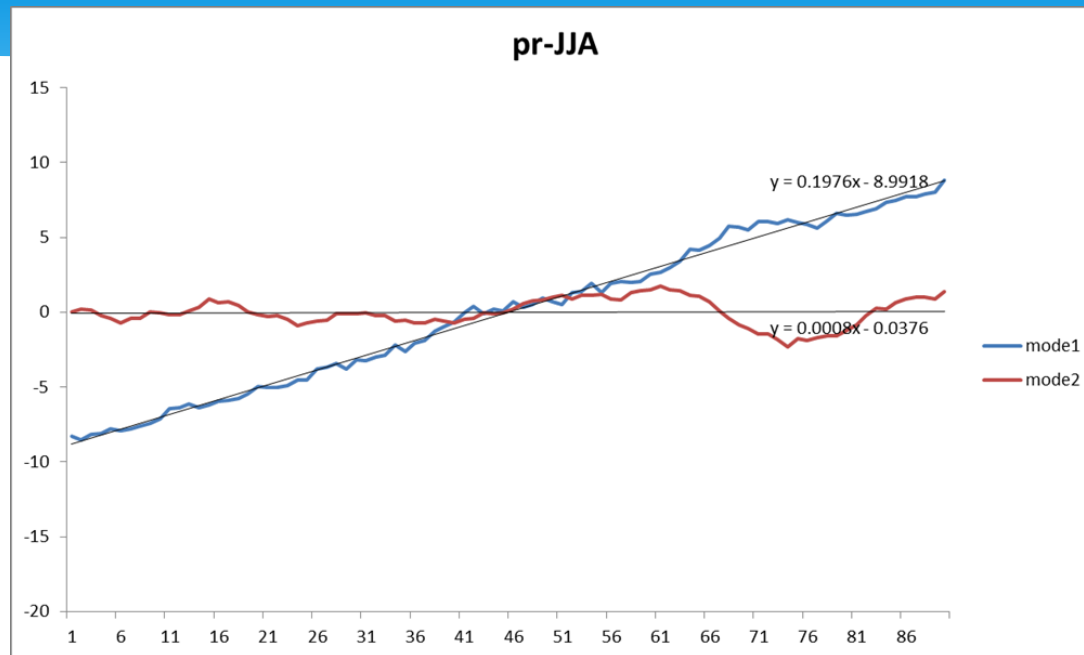
Summer rainfall: 65-70% to be wet (100% to be warm)

Pr(JJA)









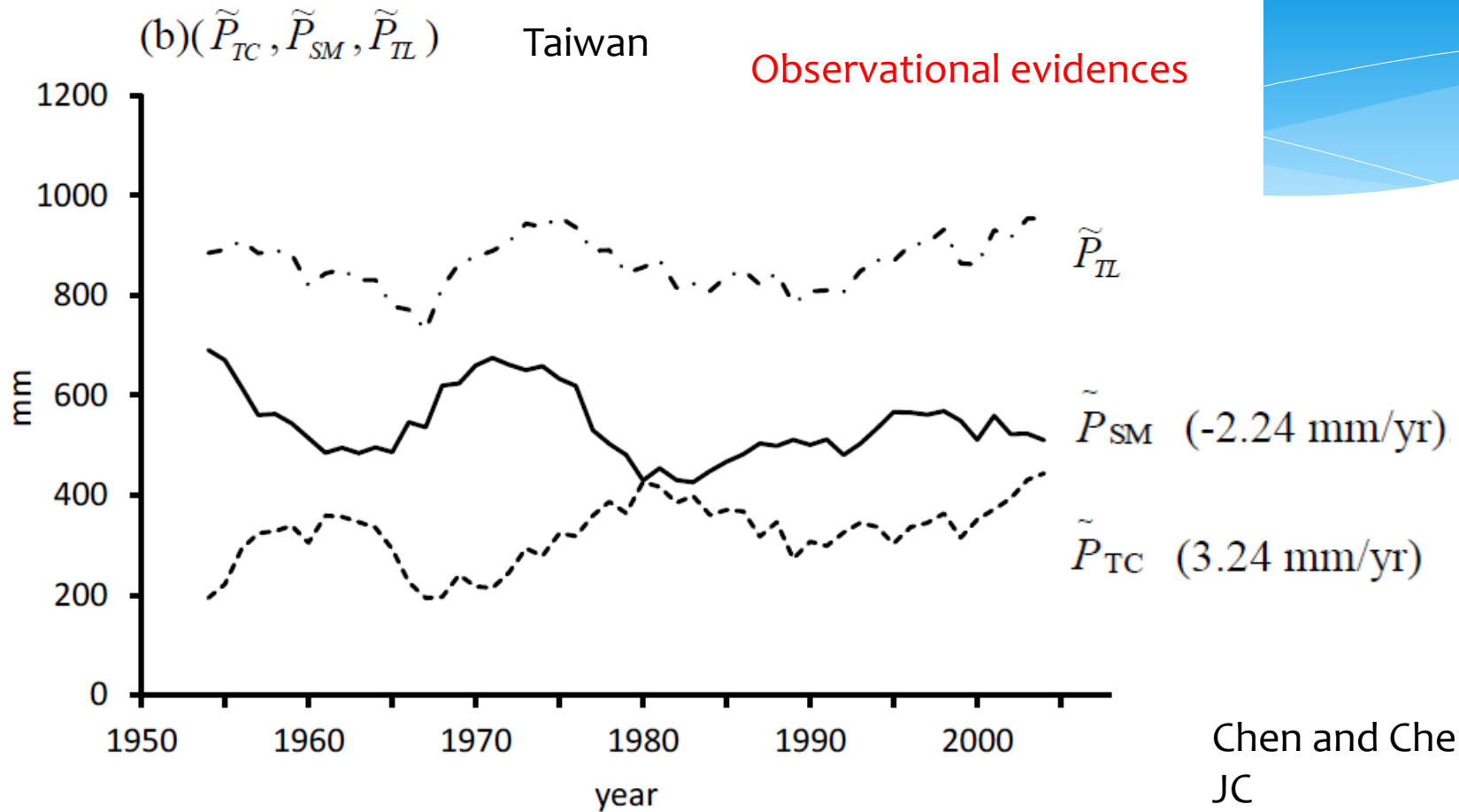


## IPCC-projected summer climate in Taiwan:

- 100% chance to be warm  
closely connects with CO<sub>2</sub> concentration
- 65% chance to be wet  
largely dominated by tropical rainfall patterns

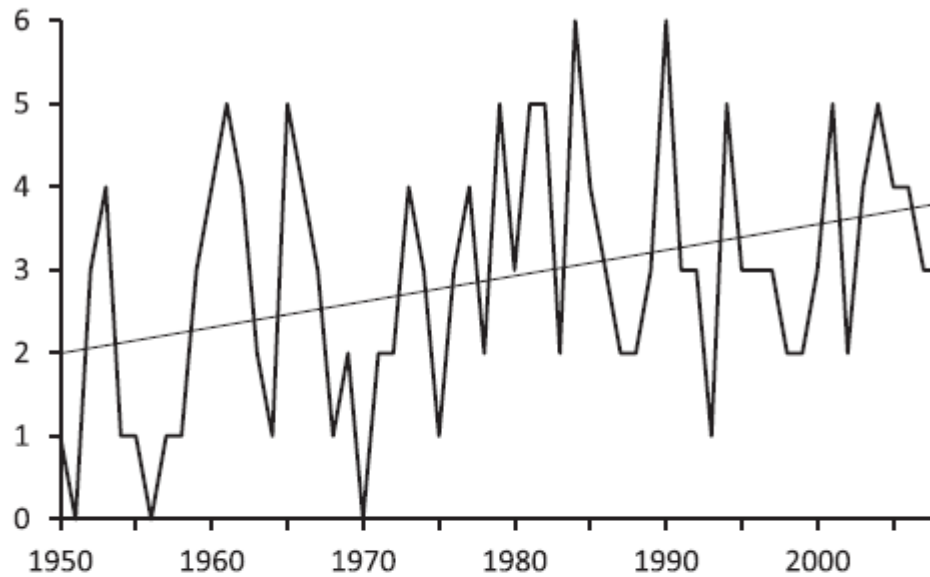
## Questions:

- What are the physical processes for increased rainfall patterns in Taiwan?
- Are these processes consistent with observational evidences of the current warming processes?

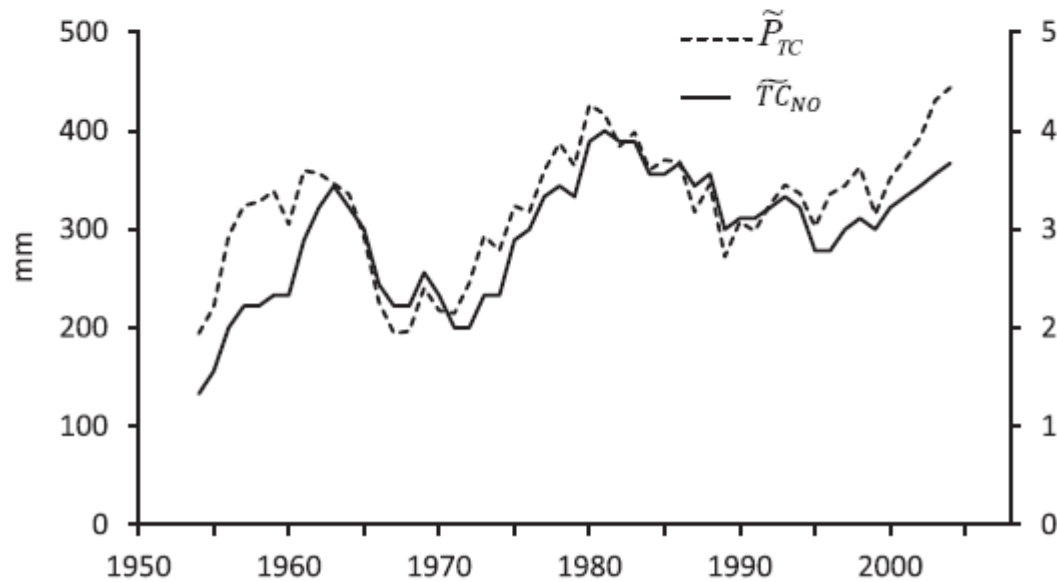


Warming trend corresponds to increasing trend of TC rainfall

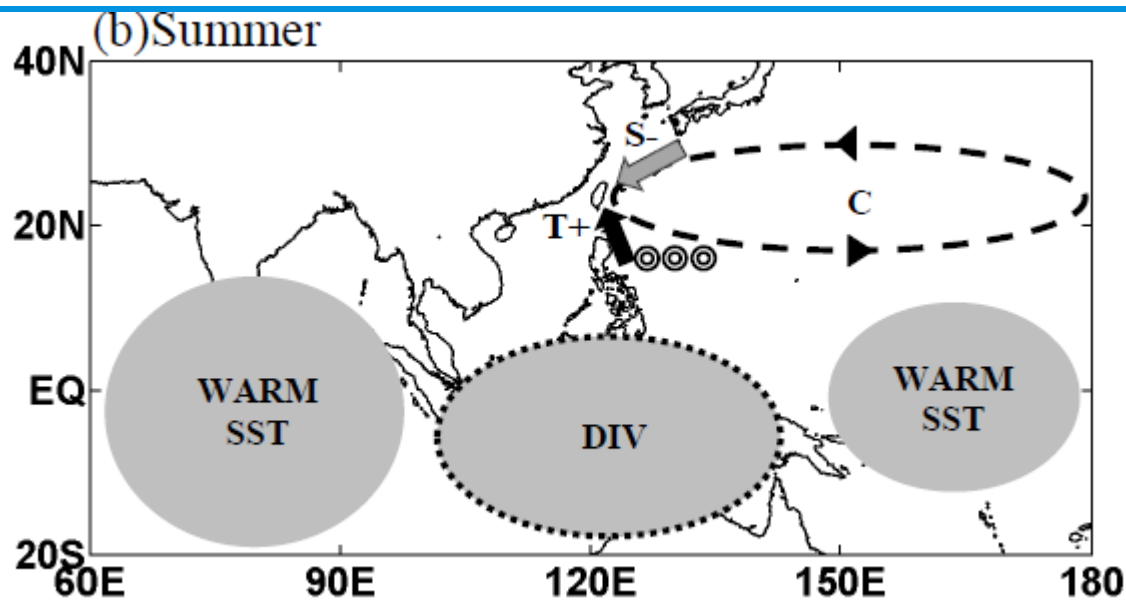
(a)  $TC_{NO}$



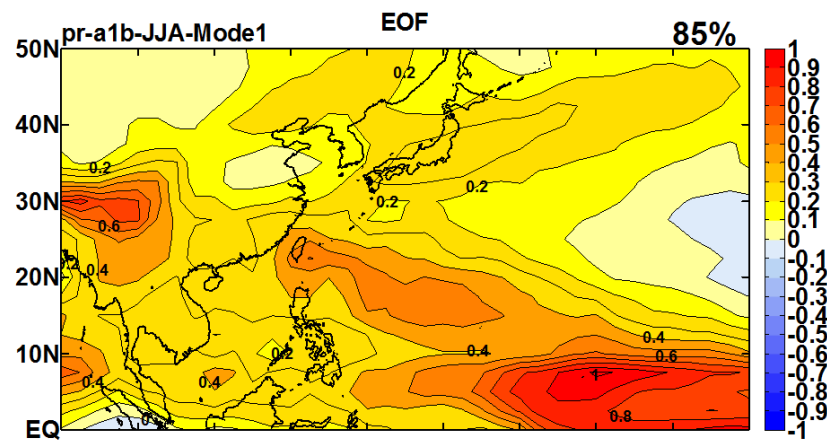
(b)  $(\tilde{TC}_{NO}, \tilde{P}_{TC})$



More TCs affecting Taiwan  
lead to increased TC rainfall



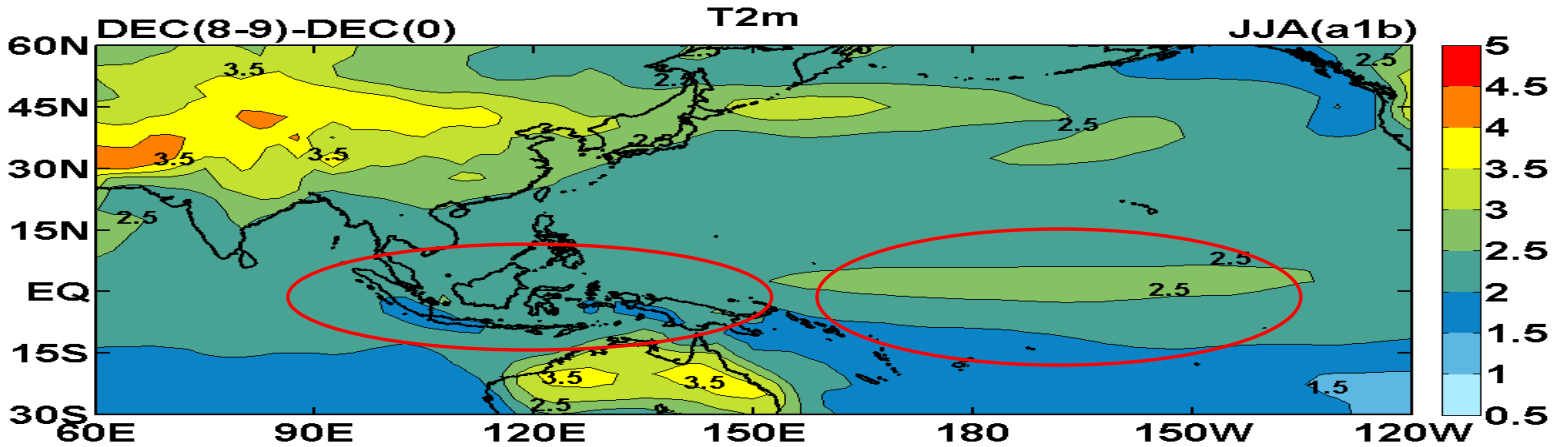
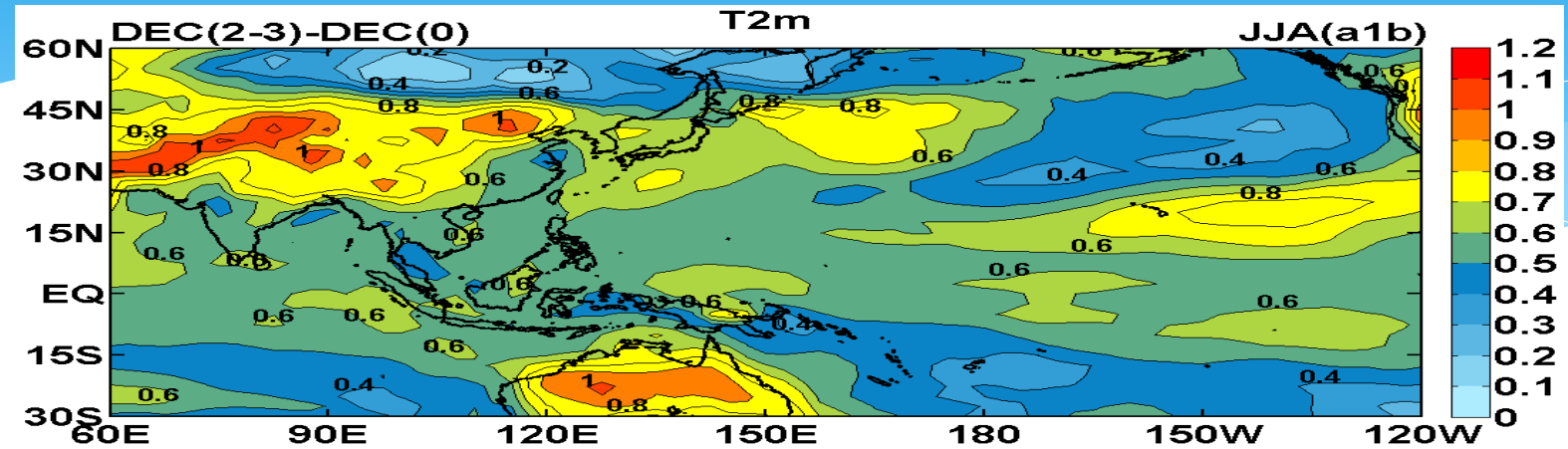
Changes in tropical  
ocean-atmosphere system  
cause more TC activity  
around Taiwan



# 年代分隔

| 年代   | 年份         |
|------|------------|
| DEC0 | 2001~10年   |
| DEC1 | 2011~20年   |
| DEC2 | 2021~30年   |
| DEC3 | 2031~40年   |
| DEC4 | 2041~50年   |
| DEC5 | 2051~60年   |
| DEC6 | 2061~70年   |
| DEC7 | 2071~80年   |
| DEC8 | 2081~90年   |
| DEC9 | 2091~2100年 |

T(2m)

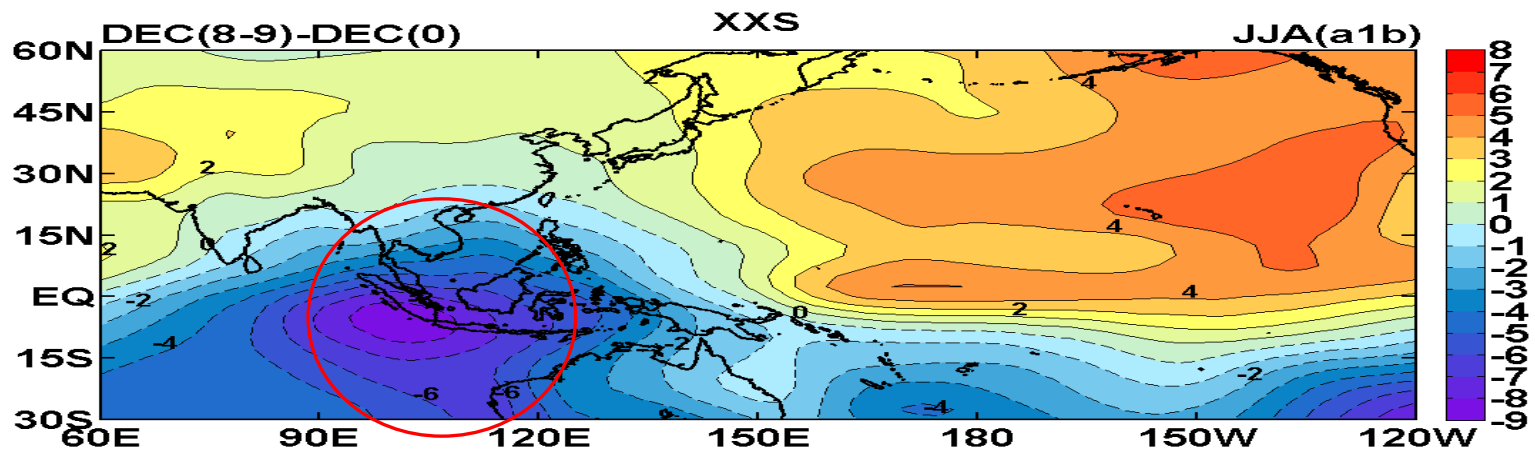
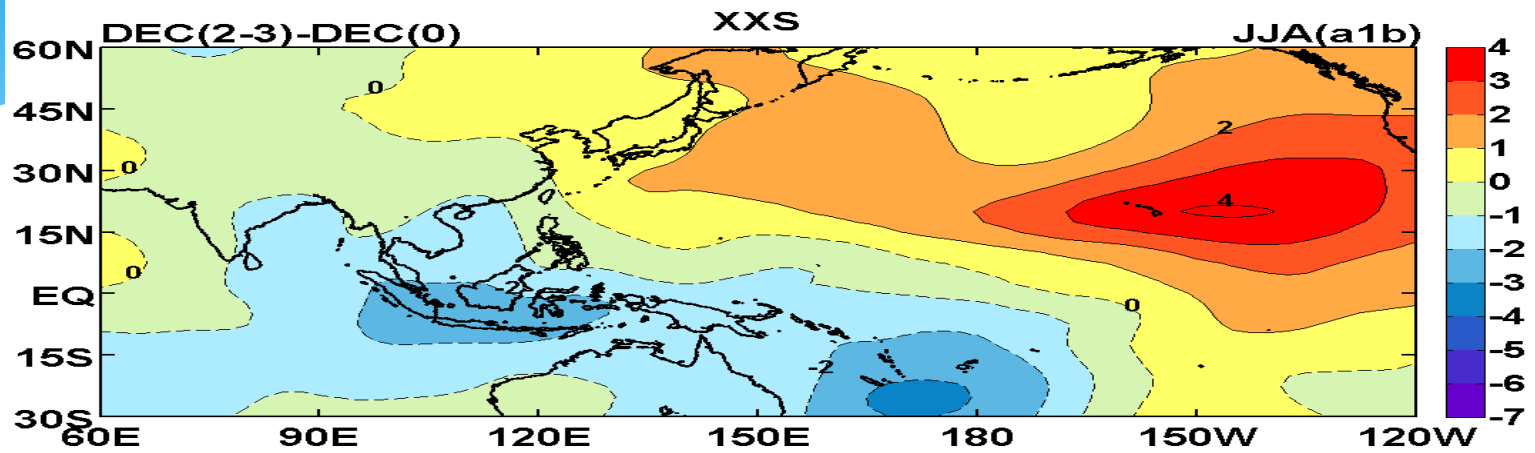


minor warming

strong warming

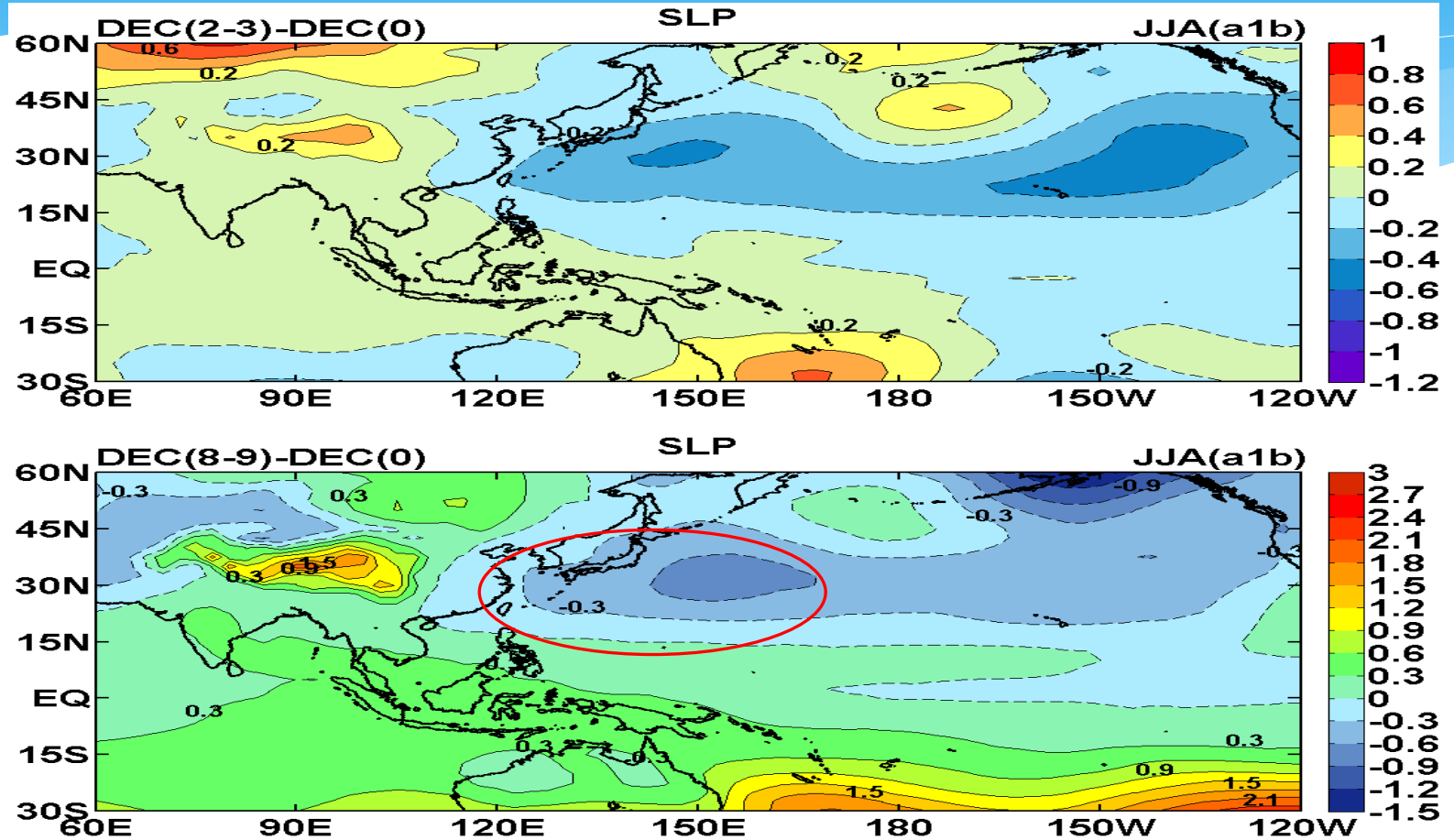


## Velocity potential



divergence anomaly

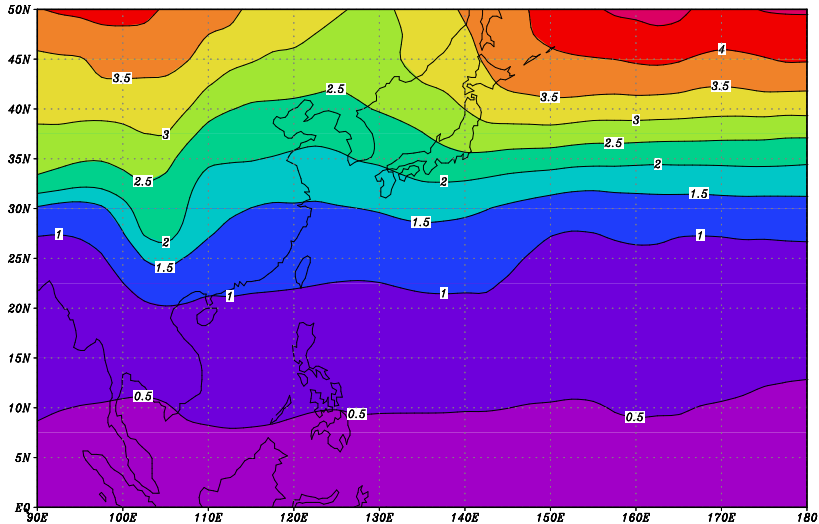
## Sea level pressure



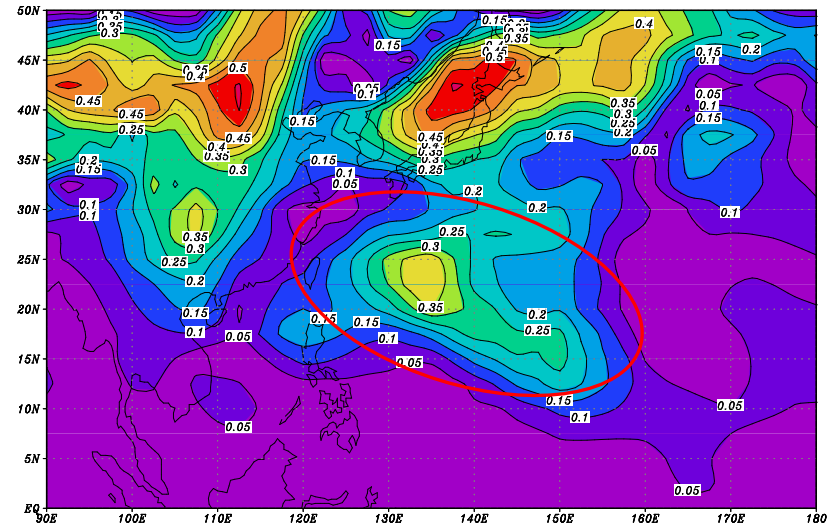
weakened Pacific subtropical high

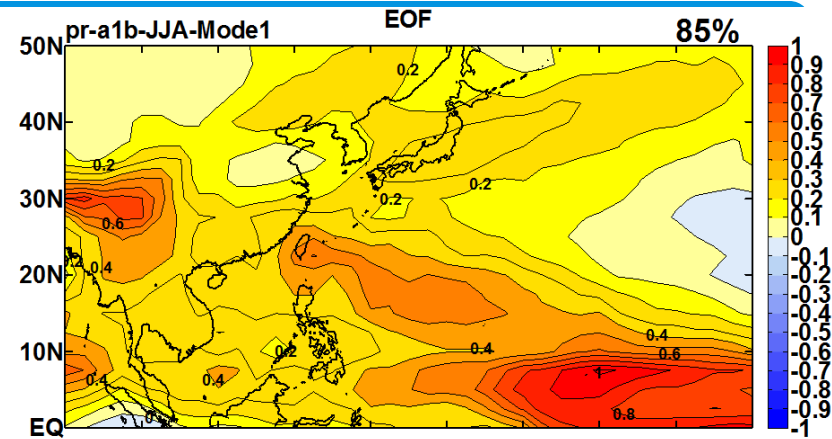
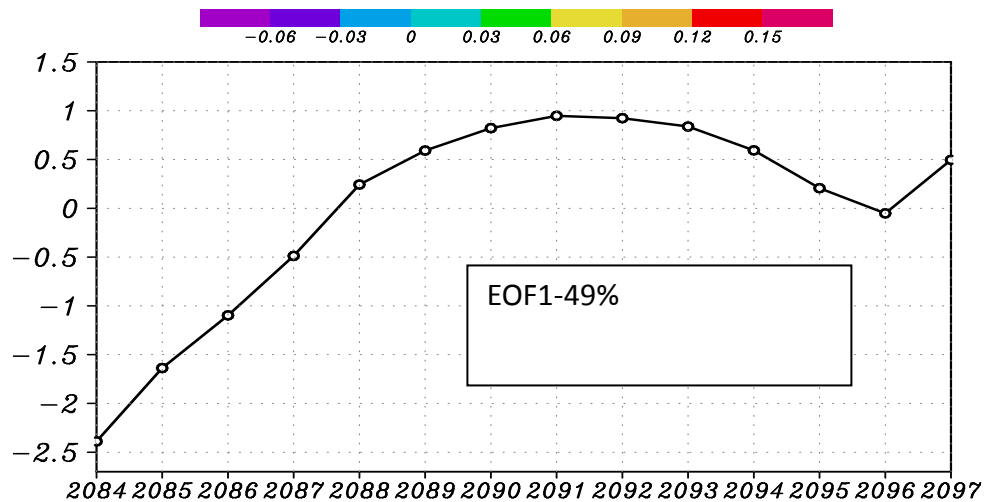
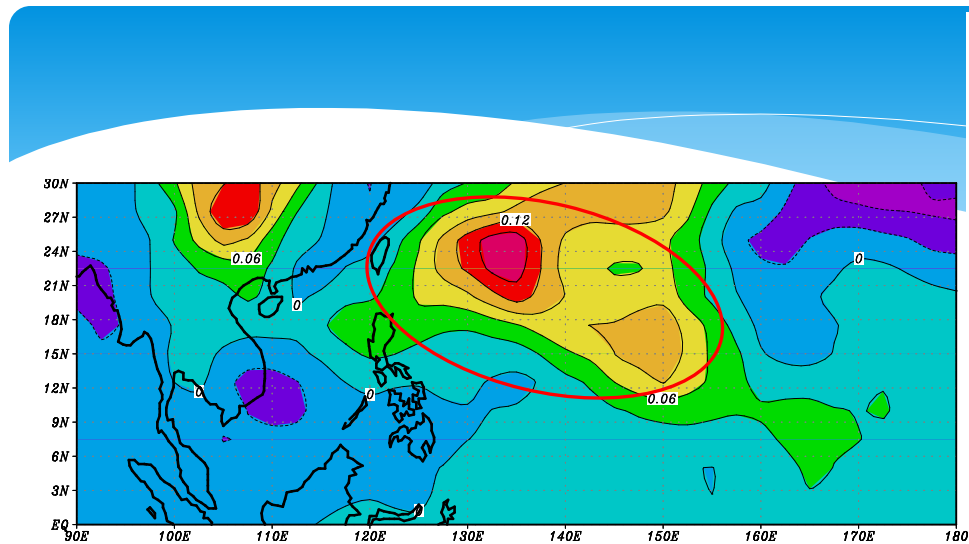
## TC activity: interpreted from RMS of 2-7-day SLP during summer

2081-2100 mean of RMS(2-7d)



RMS of RMS(2-7d) during 2081-2100





Enhanced transient (TC) activity  
to the southeast of Taiwan corresponds  
more precipitation near Taiwan  
→ Increases of TC-related extreme  
rainfall events are expected



## Concluding Remarks:

- Future summer climate in Taiwan tends to be warm and wet.
- Warming caused by increased CO<sub>2</sub> concentration.
- Wet climate corresponds to enhanced transient (TC) activity in company with weakened Pacific subtropical high under global warming effects.

| b1-tas-JJA        |   |                 | slope  | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-------------------|---|-----------------|--------|---------|---------|--------|--------|--------|
| bccr_bcm2_0       | 1 | 2000/01~2099/12 | 1.4302 | 33.8320 | 22.2493 | 1.717  | 2.074  | 2.819  |
| cccma_cgcm3_1     | 1 | 2000/12~2300/11 | 1.4446 | 38.6830 | 3.6667  | 2.353  | 3.182  | 5.841  |
|                   | 2 | 2000/12~2100/11 | 1.0041 | 38.1770 | 29.3421 | 1.6990 | 2.0450 | 2.7560 |
|                   | 3 |                 | 1.4192 | 34.0010 | 3.9255  | 2.353  | 3.182  | 5.841  |
|                   | 4 |                 | 1.8556 | 38.6500 | 3.9813  | 2.353  | 3.182  | 5.841  |
|                   | 5 |                 | 1.4670 | 56.5310 | 5.9111  | 2.015  | 2.571  | 4.032  |
| cccma_cgcm3_1_t63 | 1 | 2000/12~2100/11 | 2.0320 | 40.3260 | 9.6576  | 1.833  | 2.262  | 3.25   |
| cnrm_cm3          | 1 | 2000/01~2149/12 | 1.1179 | 17.8780 | 7.4251  | 1.895  | 2.365  | 3.499  |
| csiro_mk3_0       | 1 | 2000/09~2300/08 | 0.9489 | 14.8890 | 5.6980  | 2.015  | 2.571  | 4.032  |
| csiro_mk3_5       | 1 | 2000/09~2200/08 | 3.7824 | 18.4980 | 4.7964  | 2.132  | 2.776  | 4.604  |
| gfdl_cm2_0        | 1 | 2001/01~2200/12 | 1.6041 | 53.2300 | 3.4220  | 2.353  | 3.182  | 5.841  |
| gfdl_cm2_1        | 1 | 2001/01~2100/12 | 0.7774 | 6.1020  | 17.3265 | 1.74   | 2.11   | 2.898  |
| iap_fgoals1_0_g   | 1 | 1999/12~2199/11 | 2.7102 | 45.6180 | 4.9944  | 2.132  | 2.776  | 4.604  |
|                   | 2 |                 | 2.4809 | 61.6520 | 4.8754  | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | 2.1536 | 65.1550 | 8.6514  | 1.86   | 2.306  | 3.355  |
| inmcm3_0          | 1 | 2001/01~2200/12 | 1.3105 | 45.8790 | 5.6521  | 2.015  | 2.571  | 4.032  |
| ipsl_cm4          | 2 | 2000/01~2100/12 | 1.7951 | 53.5360 | 4.0316  | 2.132  | 2.776  | 4.604  |
| miroc3_2_hires    | 3 | 2001/01~2100/12 | 3.3883 | 54.5620 | 2.9241  | 2.92   | 4.303  | 9.925  |
| miroc3_2_medres   | 1 | 2001/01~2300/12 | 2.6465 | 20.0630 | 3.2121  | 2.353  | 3.182  | 5.841  |
|                   | 2 | 2001/01~2100/12 | 2.7030 | 45.8010 | 3.2341  | 2.353  | 3.182  | 5.841  |
|                   | 3 |                 | 2.6104 | 34.5250 | 3.5123  | 2.353  | 3.182  | 5.841  |
| mpi_echam5        | 1 | 2001/01~2200/12 | 2.2600 | 63.5760 | 3.0755  | 2.353  | 3.182  | 5.841  |
|                   | 2 | 2001/01~2100/12 | 2.2898 | 55.9850 | 2.7437  | 2.92   | 4.303  | 9.925  |
|                   | 3 | 2001/01~2200/12 | 2.2072 | 61.1040 | 4.4396  | 2.132  | 2.776  | 4.604  |
| mri_cgcm2_3_2a    | 1 | 2000/11~2100/10 | 1.5563 | 49.1420 | 3.4149  | 2.353  | 3.182  | 5.841  |
|                   | 2 |                 | 1.8134 | 42.6230 | 4.1396  | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | 1.6080 | 49.1440 | 2.7659  | 2.92   | 4.303  | 9.925  |
|                   | 4 |                 | 1.7055 | 51.0790 | 6.0303  | 1.943  | 2.447  | 3.707  |
|                   | 5 |                 | 1.6450 | 37.9520 | 3.7652  | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3       | 1 | 2000/1~2199/12  | 3.1285 | 44.9830 | 3.6000  | 2.353  | 3.182  | 5.841  |
| miub_echo_g       | 1 | 1999/01~2198/12 | 0.6755 | 8.1560  | 10.2565 | 1.812  | 2.228  | 3.169  |
|                   | 2 |                 | 1.2217 | 6.8520  | 14.3257 | 1.761  | 2.145  | 2.977  |
|                   | 3 |                 | 0.9801 | 6.1030  | 9.4524  | 1.833  | 2.262  | 3.25   |
| ncar_ccsm3_0      | 1 | 1999/09~2099/08 | 1.6432 | 15.9690 | 18.6987 | 1.734  | 2.101  | 2.878  |
|                   | 2 |                 | 1.7756 | 9.2160  | 12.7552 | 1.782  | 2.179  | 3.055  |
|                   | 3 |                 | 1.7953 | 16.2590 | 6.3441  | 1.943  | 2.447  | 3.707  |
|                   | 4 |                 | 0.7613 | 11.8170 | 7.9829  | 1.895  | 2.365  | 3.499  |
|                   | 5 |                 | 2.5172 | 8.5160  | 13.5226 | 1.771  | 2.16   | 3.012  |
|                   | 6 |                 | 1.9443 | 12.3220 | 8.8345  | 1.86   | 2.306  | 3.355  |
|                   | 7 |                 | 1.8125 | 12.4740 | 8.7030  | 1.86   | 2.306  | 3.355  |
|                   | 8 |                 | 1.9028 | 22.4600 | 7.3458  | 1.895  | 2.365  | 3.499  |
|                   | 9 |                 | 1.0876 | 6.2530  | 15.3146 | 1.753  | 2.131  | 2.947  |
| ncar_pcm1         | 1 | 2199/07~2299/06 |        |         |         |        |        |        |
|                   | 2 | 1999/09~2199/08 | 1.5166 | 11.8260 | 12.9751 | 1.782  | 2.179  | 3.055  |
|                   | 3 |                 | 0.5875 | 2.4640  | 13.4067 | 1.771  | 2.16   | 3.012  |
|                   | 4 | 2099/11~2200/07 |        |         |         |        |        |        |

| a1b-tas-JJA       |   |                 | slope  | t-value  | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-------------------|---|-----------------|--------|----------|---------|--------|--------|--------|
| bccr_bcm2_0       | 1 | 2000/01~2099/12 | 2.3962 | 18.8890  | 4.6123  | 2.132  | 2.776  | 4.604  |
| cccma_cgcm3_1     | 1 | 2000/12~2100/11 | 2.3742 | 14.0560  | 11.6261 | 1.796  | 2.201  | 3.106  |
|                   | 2 |                 | 2.1777 | 127.7640 | 5.1688  | 2.015  | 2.571  | 4.032  |
|                   | 3 |                 | 2.6919 | 69.3720  | 3.3783  | 2.353  | 3.182  | 5.841  |
|                   | 4 |                 | 2.3948 | 81.9310  | 3.8452  | 2.353  | 3.182  | 5.841  |
|                   | 5 |                 | 2.3654 | 22.2400  | 3.3363  | 2.353  | 3.182  | 5.841  |
| cccma_cgcm3_1_t63 | 1 | 2000/12~2100/11 | 2.4801 | 88.3780  | 6.8518  | 1.943  | 2.447  | 3.707  |
| cnrm_cm3          | 1 | 2000/01~2209/12 | 2.4086 | 39.5550  | 2.8456  | 2.92   | 4.303  | 9.925  |
| csiro_mk3_0       | 1 | 2000/09~2200/08 | 1.3005 | 15.6650  | 6.9787  | 1.943  | 2.447  | 3.707  |
| csiro_mk3_5       | 1 | 2000/09~2100/08 | 7.3780 | 68.7730  | 2.5708  | 2.92   | 4.303  | 9.925  |
| gfdl_cm2_0        | 1 | 2001/01~2200/12 | 3.1832 | 81.3980  | 3.0484  | 2.353  | 3.182  | 5.841  |
| gfdl_cm2_1        | 1 | 2001/01~2200/12 | 2.8575 | 81.2670  | 5.6232  | 2.015  | 2.571  | 4.032  |
| giss_model_e_h    | 1 | 2000/1~2099/12  | 3.1227 | 21.8700  | 4.8963  | 2.132  | 2.776  | 4.604  |
|                   | 2 |                 | 2.5602 | 68.1730  | 3.1105  | 2.353  | 3.182  | 5.841  |
|                   | 3 |                 | 2.2502 | 29.1010  | 3.5726  | 2.353  | 3.182  | 5.841  |
| iap_fgoals1_0_g   | 1 | 1999/12~2199/11 | 1.9874 | 28.3870  | 9.0230  | 1.833  | 2.262  | 3.25   |
|                   | 2 |                 | 1.9216 | 91.1630  | 8.0758  | 1.86   | 2.306  | 3.355  |
|                   | 3 |                 | 1.8472 | 34.2420  | 7.2239  | 1.895  | 2.365  | 3.499  |
| ingv_echam4       | 1 | 2001/01~2100/12 | 3.8367 | 27.0690  | 3.0792  | 2.353  | 3.182  | 5.841  |
| inmcm3_0          | 1 | 2001/01~2200/12 | 1.8185 | 43.6460  | 10.4642 | 1.812  | 2.228  | 3.169  |
| ipsl_cm4          | 1 | 2000/01~2100/12 | 3.2679 | 30.9690  | 3.0206  | 2.353  | 3.182  | 5.841  |
| miroc3_2_hires    | 1 | 2001/01~2100/12 | 5.5597 | 54.1310  | 3.8699  | 2.353  | 3.182  | 5.841  |
| miroc3_2_medres   | 1 | 2001/01~2300/12 | 4.3376 | 54.5610  | 2.6571  | 2.92   | 4.303  | 9.925  |
|                   | 2 | 2001/01~2100/12 | 4.0071 | 35.5480  | 2.8591  | 2.92   | 4.303  | 9.925  |
|                   | 3 |                 | 4.3009 | 74.8470  | 2.7580  | 2.92   | 4.303  | 9.925  |
| mpi_echam5        | 1 | 2001/01~2200/12 | 3.5788 | 25.4670  | 2.5533  | 2.92   | 4.303  | 9.925  |
|                   | 2 | 2001/01~2300/12 | 3.8118 | 32.5820  | 2.9590  | 2.92   | 4.303  | 9.925  |
|                   | 3 | 2001/01~2200/12 | 4.0072 | 13.5950  | 2.4932  | 2.92   | 4.303  | 9.925  |
|                   | 4 | 2001/01~2100/12 | 3.3344 | 23.2500  | 3.3817  | 2.353  | 3.182  | 5.841  |
| mri_cgcm2_3_2a    | 1 | 2000/11~2100/10 | 2.6550 | 23.1850  | 4.9852  | 2.132  | 2.776  | 4.604  |
|                   | 2 |                 | 2.1886 | 56.6890  | 4.5048  | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | 2.7390 | 73.9010  | 4.9427  | 2.132  | 2.776  | 4.604  |
|                   | 4 |                 | 2.2716 | 28.4420  | 8.0131  | 1.86   | 2.306  | 3.355  |
|                   | 5 |                 | 2.5110 | 24.9230  | 3.2294  | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3       | 1 | 2000/01~2199/11 | 3.9027 | 29.5570  | 4.1894  | 2.132  | 2.776  | 4.604  |
| miub_echo_g       | 1 | 1999/01~2298/12 | 1.9847 | 105.6050 | 2.6737  | 2.92   | 4.303  | 9.925  |
|                   | 2 | 1999/01~2198/12 | 2.4037 | 17.2620  | 4.7870  | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | 2.2110 | 22.8960  | 3.5051  | 2.353  | 3.182  | 5.841  |
| ncar_ccsm3_0      | 1 | 1999/09~2099/08 | 1.8525 | 23.8310  | 4.0881  | 2.132  | 2.776  | 4.604  |
|                   | 2 | 1999/09~2099/08 | 3.3731 | 16.0910  | 5.4010  | 2.015  | 2.571  | 4.032  |
|                   | 3 | 1999/09~2099/08 | 4.5518 | 18.0200  | 2.9097  | 2.92   | 4.303  | 9.925  |
|                   |   |                 |        |          |         |        |        |        |
|                   | 5 | 1999/09~2099/08 | 2.9770 | 16.6010  | 5.2045  | 2.015  | 2.571  | 4.032  |
|                   | 6 | 1999/09~2099/08 | 4.5211 | 18.1320  | 4.6698  | 2.132  | 2.776  | 4.604  |
|                   | 7 | 1999/09~2099/08 | 3.1285 | 13.5030  | 8.0040  | 1.86   | 2.306  | 3.355  |
|                   |   |                 |        |          |         |        |        |        |
|                   | 9 | 1999/09~2099/08 | 1.9382 | 23.1360  | 3.4553  | 2.353  | 3.182  | 5.841  |
| ncar_pcm1         | 1 | 1999/9~2099/6   | 3.5995 | 20.2400  | 3.8398  | 2.353  | 3.182  | 5.841  |
|                   | 2 | 缺               |        |          |         |        |        |        |
|                   | 3 | 1999/9~2199/8   | 1.5508 | 17.6810  | 5.3310  | 2.015  | 2.571  | 4.032  |
|                   | 4 | 1999/9~2099/8   | 3.4470 | 13.7350  | 5.9166  | 2.015  | 2.571  | 4.032  |
| ukmo_hadgem1      | 1 | 2000/01~2099/11 | 5.0164 | 31.6560  | 2.9136  | 2.92   | 4.303  | 9.925  |

| a2-tas-JJA      |   |                 | slope  | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-----------------|---|-----------------|--------|---------|---------|--------|--------|--------|
| bccr_bcm2_0     | 1 | 2000/01~2099/12 | 3.6980 | 31.8560 | 2.7783  | 2.92   | 4.303  | 9.925  |
| cccma_cgcm3_1   | 1 | 2000/12~2100/11 | 3.4953 | 27.0590 | 5.5405  | 2.015  | 2.571  | 4.032  |
|                 | 2 |                 | 3.9608 | 51.0010 | 3.4090  | 2.353  | 3.182  | 5.841  |
|                 | 3 |                 | 3.3560 | 66.9430 | 3.9609  | 2.353  | 3.182  | 5.841  |
|                 | 4 |                 | 2.8843 | 91.8150 | 6.2260  | 1.943  | 2.447  | 3.707  |
|                 | 5 |                 | 3.2523 | 69.7270 | 4.3393  | 2.132  | 2.776  | 4.604  |
| cnrm_cm3        | 1 | 2000/01~2099/12 | 4.3190 | 28.2070 | 3.7008  | 2.353  | 3.182  | 5.841  |
| csiro_mk3_0     | 1 | 2000/9~2100/8   | 1.9978 | 38.7850 | 3.2122  | 2.353  | 3.182  | 5.841  |
| csiro_mk3_5     | 1 | 2000/09~2100/08 | 7.8051 | 46.4810 | 2.6765  | 2.92   | 4.303  | 9.925  |
| gfdl_cm2_0      | 1 | 2001/01~2100/12 | 3.5505 | 38.0370 | 5.4542  | 2.015  | 2.571  | 4.032  |
| gfdl_cm2_1      | 1 | 2001/01~2100/12 | 2.8529 | 42.1050 | 5.7599  | 2.015  | 2.571  | 4.032  |
| ingv_echam4     | 1 | 2001/01~2100/12 | 4.6808 | 55.9480 | 2.9439  | 2.92   | 4.303  | 9.925  |
| inmcm3_0        | 1 | 2001/01~2200/12 | 4.9624 | 17.0250 | 5.1281  | 2.015  | 2.571  | 4.032  |
| ipsl_cm4        | 1 | 2000/01~2100/12 | 3.2097 | 55.5680 | 2.8931  | 2.92   | 4.303  | 9.925  |
| miroc3_2_medres | 1 | 2001/01~2100/12 | 5.0210 | 32.8430 | 2.5800  | 2.92   | 4.303  | 9.925  |
|                 | 2 |                 | 4.6186 | 58.3190 | 2.7278  | 2.92   | 4.303  | 9.925  |
|                 | 3 |                 | 5.2370 | 40.2390 | 2.8389  | 2.92   | 4.303  | 9.925  |
| mpi_echam5      | 1 | 2001/01~2100/12 | 3.8770 | 42.1500 | 2.4396  | 2.92   | 4.303  | 9.925  |
|                 | 2 |                 | 3.4659 | 39.8710 | 10.2752 | 1.812  | 2.228  | 3.169  |
|                 | 3 |                 | 4.0578 | 54.5250 | 2.4022  | 2.92   | 4.303  | 9.925  |
| mri_cgcm2_3_2a  | 1 | 2000/11~2100/10 | 2.7872 | 52.9970 | 8.7836  | 1.86   | 2.306  | 3.355  |
|                 | 2 |                 | 3.2495 | 67.4540 | 2.6982  | 2.92   | 4.303  | 9.925  |
|                 | 3 |                 | 3.3057 | 72.6040 | 3.7906  | 2.353  | 3.182  | 5.841  |
|                 | 4 |                 | 2.9556 | 29.7480 | 2.8113  | 2.92   | 4.303  | 9.925  |
|                 | 5 |                 | 3.0469 | 56.4180 | 3.1250  | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3     | 1 | 2000/01~2099/12 | 6.1491 | 87.7970 | 10.0286 | 1.812  | 2.228  | 3.169  |
| miub_echo_g     | 1 | 1999/01~2098/12 | 2.3404 | 19.6520 | 4.0135  | 2.132  | 2.776  | 4.604  |
|                 | 2 |                 | 2.9621 | 17.2120 | 4.8175  | 2.132  | 2.776  | 4.604  |
|                 | 3 |                 | 1.8814 | 17.8260 | 4.4087  | 2.132  | 2.776  | 4.604  |
| ncar_ccsm3_0    | 1 | 1999/09~2099/08 | 3.0318 | 43.0170 | 3.5519  | 2.353  | 3.182  | 5.841  |
|                 | 2 | 1999/09~2099/08 | 5.5313 | 28.5380 | 2.8486  | 2.92   | 4.303  | 9.925  |
|                 | 3 | 1999/09~2099/08 | 6.4313 | 46.1330 | 5.0368  | 2.015  | 2.571  | 4.032  |
|                 | 4 | 1999/09~2099/08 | 3.0196 | 25.5440 | 2.7541  | 2.92   | 4.303  | 9.925  |
|                 | 5 | 1999/09~2089/08 | 0.0000 |         |         |        |        |        |
| ncar_pcm1       | 1 | 缺               | 0.0000 |         |         |        |        |        |
|                 | 2 | 1999/9~2099/8   | 3.4509 | 12.3790 | 6.4096  | 1.943  | 2.447  | 3.707  |
|                 | 3 | 1999/9~2099/8   | 2.2650 | 12.5570 | 7.4029  | 1.895  | 2.365  | 3.499  |
|                 | 4 | 1999/9~2099/8   | 4.8988 | 17.5310 | 4.2845  | 2.132  | 2.776  | 4.604  |
| ukmo_hadgem1    | 1 | 2000/1~2099/11  | 6.3673 | 37.2880 | 2.5754  | 2.92   | 4.303  | 9.925  |



|                   | b1-tas-DJF |                 | slope   | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-------------------|------------|-----------------|---------|---------|---------|--------|--------|--------|
| bccr_bcm2_0       | 1          | 2000/01~2099/12 | -0.0002 | 12.0900 | 8.1669  | 1.86   | 2.306  | 3.355  |
| cccma_cgcm3_1     | 1          | 2000/12~2300/11 | -0.0006 | 21.4560 | 4.4404  | 2.132  | 2.776  | 4.604  |
|                   | 2          | 2000/12~2100/11 | 0.0006  | 21.7650 | 7.8272  | 1.895  | 2.365  | 3.499  |
|                   | 3          |                 | 0.0001  | 31.3080 | 3.4673  | 2.353  | 3.182  | 5.841  |
|                   | 4          |                 | -0.0016 | 25.6410 | 16.2714 | 1.746  | 2.12   | 2.921  |
|                   | 5          |                 | -0.0014 | 26.3420 | 3.9225  | 2.353  | 3.182  | 5.841  |
| cccma_cgcm3_1_t63 | 1          | 2000/12~2100/11 | -0.0008 | 24.0390 | 3.1506  | 2.353  | 3.182  | 5.841  |
| cnrm_cm3          | 1          | 2000/01~2149/12 | 1.2347  | 18.0390 | 5.8288  | 2.015  | 2.571  | 4.032  |
| csiro_mk3_0       | 1          | 2000/09~2300/08 | -0.0013 | 0.0290  | 4.8648  | 2.132  | 2.776  | 4.604  |
| csiro_mk3_5       | 1          | 2000/09~2200/08 | 0.0009  | 27.6520 | 3.5359  | 2.353  | 3.182  | 5.841  |
| gfdl_cm2_0        | 1          | 2001/01~2200/12 | 1.7072  | 12.4320 | 6.4377  | 1.943  | 2.447  | 3.707  |
| gfdl_cm2_1        | 1          | 2001/01~2100/12 | 0.0010  | 14.8230 | 5.1512  | 2.015  | 2.571  | 4.032  |
| iap_fgoals1_0_g   | 1          | 1999/12~2199/11 | 0.9763  | 19.1300 | 8.3678  | 1.86   | 2.306  | 3.355  |
|                   | 2          |                 | 0.0000  | 18.7300 | 7.0420  | 1.895  | 2.365  | 3.499  |
|                   | 3          |                 | -0.0007 | 42.5920 | 4.8385  | 2.132  | 2.776  | 4.604  |
| inmcm3_0          | 1          | 2001/01~2200/12 | 1.2363  | 14.8100 | 5.5258  | 2.015  | 2.571  | 4.032  |
| ipsl_cm4          | 1          | 2000/01~2100/12 | 0.0001  | 14.1390 | 6.5587  | 1.943  | 2.447  | 3.707  |
| miroc3_2_hires    | 1          | 2001/01~2100/12 | -0.0009 | 27.7220 | 3.5287  | 2.353  | 3.182  | 5.841  |
| miroc3_2_medres   | 1          | 2001/01~2300/12 | 1.6387  | 24.4150 | 3.0265  | 2.353  | 3.182  | 5.841  |
|                   | 2          | 2001/01~2100/12 | 0.0015  | 33.2770 | 3.1051  | 2.353  | 3.182  | 5.841  |
|                   | 3          |                 | 2.0095  | 24.6120 | 4.0460  | 2.132  | 2.776  | 4.604  |
| mpi_echam5        | 1          | 2001/01~2200/12 | -0.0007 | -0.0110 | 4.3781  | 2.132  | 2.776  | 4.604  |
|                   | 2          | 2001/01~2100/12 | -0.0011 | 33.8830 | 3.0935  | 2.353  | 3.182  | 5.841  |
|                   | 3          | 2001/01~2200/12 | 0.0011  | 31.1690 | 3.3430  | 2.353  | 3.182  | 5.841  |
| mri_cgcm2_3_2a    | 1          | 2000/11~2100/10 | 0.0014  | 33.8650 | 3.4105  | 2.353  | 3.182  | 5.841  |
|                   | 2          |                 | 0.0008  | 33.9940 | 2.9549  | 2.92   | 4.303  | 9.925  |
|                   | 3          |                 | 0.0016  | 0.3050  | 5.4513  | 2.015  | 2.571  | 4.032  |
|                   | 4          |                 | 1.4762  | 29.0930 | 5.9638  | 2.015  | 2.571  | 4.032  |
|                   | 5          |                 | 1.6745  | 21.2780 | 3.5332  | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3       | 1          | 2000/1~2199/12  | 2.0053  | 25.7200 | 3.6001  | 2.353  | 3.182  | 5.841  |
| miub_echo_g       | 1          | 1999/01~2198/12 | -0.0007 | 2.2010  | 3.6901  | 2.353  | 3.182  | 5.841  |
|                   | 2          |                 | -0.0004 | 0.4470  | 5.6071  | 2.015  | 2.571  | 4.032  |
|                   | 3          |                 | 0.0016  | 8.7970  | 3.5941  | 2.353  | 3.182  | 5.841  |
| ncar_ccsm3_0      | 1          | 1999/09~2099/08 | 0.0020  | 2.6330  | 7.9973  | 1.895  | 2.365  | 3.499  |
|                   | 2          |                 | 0.8659  | 21.6030 | 32.7187 | 1.697  | 2.042  | 2.75   |
|                   | 3          |                 | -0.0013 | 22.4790 | 7.1371  | 1.895  | 2.365  | 3.499  |
|                   | 4          |                 | -0.0008 | 4.4560  | 8.1685  | 1.86   | 2.306  | 3.355  |
|                   | 5          |                 | 1.1183  | 0.9700  | 13.3014 | 1.771  | 2.16   | 3.012  |
|                   | 6          |                 | -0.0010 | 15.9720 | 4.9299  | 2.132  | 2.776  | 4.604  |
|                   | 7          |                 | -0.0013 | 1.2980  | 6.7013  | 1.943  | 2.447  | 3.707  |
|                   | 8          |                 | -0.0010 | 21.7610 | 4.5976  | 2.132  | 2.776  | 4.604  |
|                   | 9          |                 | -0.0001 | 1.9700  | 4.1964  | 2.132  | 2.776  | 4.604  |
| ncar_pcm1         | 1          | 2199/07~2299/06 |         |         |         |        |        |        |
|                   | 2          | 1999/09~2199/08 | 0.0000  | 0.9210  | 3.6319  | 2.353  | 3.182  | 5.841  |
|                   | 3          |                 | -0.0002 | 1.7790  | 4.8271  | 2.132  | 2.776  | 4.604  |
|                   | 4          | 2099/11~2200/07 |         |         |         |        |        |        |

| a1b-tas-DJF       |   |                 | slope   | t-value | EDF       | 0.0500 | 0.0250 | 0.0050 |
|-------------------|---|-----------------|---------|---------|-----------|--------|--------|--------|
| bccr_bcm2_0       | 1 | 2000/01~2099/12 | 2.2220  | -0.0400 | 3.9837    | 2.353  | 3.182  | 5.841  |
| cccma_cgcm3_1     | 1 | 2000/12~2100/11 | 0.0003  | -0.0670 | 3.3797    | 2.353  | 3.182  | 5.841  |
|                   | 2 |                 | 1.9066  | 27.0820 | 3.4731    | 2.353  | 3.182  | 5.841  |
|                   | 3 |                 | 2.1444  | 35.8120 | 2.7462    | 2.92   | 4.303  | 9.925  |
|                   | 4 |                 | -0.0009 | 0.0680  | 6.2082    | 1.943  | 2.447  | 3.707  |
|                   | 5 |                 | 1.8429  | 41.5790 | 3.9959    | 2.353  | 3.182  | 5.841  |
| cccma_cgcm3_1_t63 | 1 | 2000/12~2100/11 | 0.0012  | -0.3010 | 4.8465    | 2.132  | 2.776  | 4.604  |
| cnrm_cm3          | 1 | 2000/01~2209/12 | 2.6227  | 0.0580  | 2.8290    | 2.92   | 4.303  | 9.925  |
| csiro_mk3_0       | 1 | 2000/09~2200/08 | 1.8035  | 23.3990 | 4.1126    | 2.132  | 2.776  | 4.604  |
| csiro_mk3_5       | 1 | 2000/09~2100/08 | 0.0001  | 0.0000  | 5.1525    | 2.015  | 2.571  | 4.032  |
| gfdl_cm2_0        | 1 | 2001/01~2200/12 | 0.0001  | 30.9050 | 2.9731    | 2.92   | 4.303  | 9.925  |
| gfdl_cm2_1        | 1 | 2001/01~2200/12 | 0.0010  | 17.1830 | 4.1367    | 2.132  | 2.776  | 4.604  |
| giss_model_e_h    | 1 | 2000/1~2099/12  | 0.0017  | -0.1840 | 4.3036    | 2.132  | 2.776  | 4.604  |
|                   | 2 |                 | 2.7598  | 30.6520 | 2.9120    | 2.92   | 4.303  | 9.925  |
|                   | 3 |                 | 2.5765  | 0.0270  | 2.6507    | 2.92   | 4.303  | 9.925  |
| iap_fgots1_0_g    | 1 | 1999/12~2199/11 | 2.2177  | 0.1100  | 3.2445    | 2.353  | 3.182  | 5.841  |
|                   | 2 |                 | 2.2280  | 0.0600  | 4.5072    | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | 2.1055  | -0.5030 | 4.1521    | 2.132  | 2.776  | 4.604  |
| ingv_echam4       | 1 | 2001/01~2100/12 | 1.7280  | 34.1320 | 3.6601    | 2.353  | 3.182  | 5.841  |
| inmcm3_0          | 1 | 2001/01~2200/12 | 0.0009  | -0.3760 | 4.4766    | 2.132  | 2.776  | 4.604  |
| ipsl_cm4          | 1 | 2000/01~2100/12 | -0.0006 | -0.6400 | 4.1800    | 2.132  | 2.776  | 4.604  |
| miroc3_2_hires    | 1 | 2001/01~2100/12 | 0.0003  | 4.6510  | 2.6781    | 2.92   | 4.303  | 9.925  |
| miroc3_2_medres   | 1 | 2001/01~2300/12 | 0.0009  | 39.2900 | 2.7885    | 2.92   | 4.303  | 9.925  |
|                   | 2 | 2001/01~2100/12 | 0.0016  | 45.2210 | 3.2382    | 2.353  | 3.182  | 5.841  |
|                   | 3 |                 | 0.0008  | 0.1230  | 2.5262    | 2.92   | 4.303  | 9.925  |
| mpi_echam5        | 1 | 2001/01~2200/12 | -0.0012 | 4.6510  | 2.8716    | 2.92   | 4.303  | 9.925  |
|                   | 2 | 2001/01~2300/12 | 3.6029  | 4.6510  | 2.5530    | 2.92   | 4.303  | 9.925  |
|                   | 3 | 2001/01~2200/12 | 3.2772  | 32.5490 | 2.9875    | 2.92   | 4.303  | 9.925  |
|                   | 4 | 2001/01~2100/12 | 3.4804  | -0.2730 | 3.0513    | 2.353  | 3.182  | 5.841  |
| mri_cgcm2_3_2a    | 1 | 2000/11~2100/10 | 2.5218  | -0.1100 | 3.1090    | 2.353  | 3.182  | 5.841  |
|                   | 2 |                 | 2.3751  | 38.4830 | 3.1215    | 2.353  | 3.182  | 5.841  |
|                   | 3 |                 | 2.1039  | 0.2800  | 3.2760    | 2.353  | 3.182  | 5.841  |
|                   | 4 |                 | 2.1239  | -4.6510 | 3.0933    | 2.353  | 3.182  | 5.841  |
|                   | 5 |                 | 2.2323  | 0.0730  | 3.2806    | 2.353  | 3.182  | 5.841  |
| ukmo_hadcm3       | 1 | 2000/01~2199/11 | 0.0010  | -0.1610 | 3.0208    | 2.353  | 3.182  | 5.841  |
| miub_echo_g       | 1 | 1999/01~2298/12 | -0.0009 | 48.2910 | 2.6562    | 2.92   | 4.303  | 9.925  |
|                   | 2 | 1999/01~2198/12 | 0.0003  | 5.4020  | 4.4589    | 2.132  | 2.776  | 4.604  |
|                   | 3 |                 | -0.0016 | 1.0660  | 3.9682    | 2.353  | 3.182  | 5.841  |
| ncar_ccsm3_0      | 1 | 1999/09~2099/08 | 2.2659  | 1.5950  | 4.5763    | 2.132  | 2.776  | 4.604  |
|                   | 2 | 1999/09~2099/08 | 0.0002  | 32.9690 | 2.8735    | 2.92   | 4.303  | 9.925  |
|                   | 3 | 1999/09~2099/08 | 0.0002  | 9.3050  | 4.2096    | 2.132  | 2.776  | 4.604  |
|                   | 4 |                 | 0.0000  |         |           |        |        |        |
|                   | 5 | 1999/09~2099/08 | 0.0010  | 2.2800  | 4.2096    | 2.132  | 2.776  | 4.604  |
|                   | 6 | 1999/09~2099/08 | -0.0007 | 1.0950  | 5.0410    | 2.015  | 2.571  | 4.032  |
|                   | 7 | 1999/09~2099/08 | 0.0004  | 2.8000  | 5.0011    | 2.015  | 2.571  | 4.032  |
|                   | 8 |                 | 0.0000  |         |           |        |        |        |
|                   | 2 | 1999/09~2099/08 | -0.0019 | 1.2750  | 4.5379    | 2.132  | 2.776  | 4.604  |
| ncar_pcm1         | 1 | 1999/9~2099/6   | 0.0012  | 9.2980  | 4.0478    | 2.132  | 2.776  | 4.604  |
|                   | 2 | 缺               | 0.0000  |         |           |        |        |        |
|                   | 3 | 1999/9~2199/8   | 0.0003  | 1.191   | 6.4023933 | 1.943  | 2.447  | 3.707  |
|                   | 4 | 1999/9~2099/8   | -0.0001 | 2.862   | 5.1412883 | 2.015  | 2.571  | 4.032  |
| ukmo_hadgem1      | 1 | 2000/01~2099/11 | 2.8024  | 2.164   | 4.9166083 | 2.132  | 2.776  | 4.604  |

| a2-tas-DJF      |   |                 | slope   | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-----------------|---|-----------------|---------|---------|---------|--------|--------|--------|
| bccr_bcm2_0     | 1 | 2000/01~2099/12 | 2.6216  | 0.1010  | 3.6077  | 2.353  | 3.182  | 5.841  |
| cccm3_cgcm3_1   | 1 | 2000/12~2100/11 | 2.9717  | 40.7810 | 3.5828  | 2.353  | 3.182  | 5.841  |
|                 | 2 |                 | 0.0007  | -0.0050 | 10.6679 | 1.812  | 2.228  | 3.169  |
|                 | 3 |                 | 3.0115  | 0.2320  | 3.5232  | 2.353  | 3.182  | 5.841  |
|                 | 4 |                 | 0.0008  | 40.9980 | 2.8330  | 2.92   | 4.303  | 9.925  |
|                 | 5 |                 | 0.0000  | 7.0630  | 5.0974  | 2.015  | 2.571  | 4.032  |
| cnrm_cm3        | 1 | 2000/01~2099/12 | 0.0002  | -0.0190 | 2.6790  | 2.92   | 4.303  | 9.925  |
| csiro_mk3_0     | 1 | 2000/9~2100/8   | 0.0010  | 0.0130  | 4.0708  | 2.132  | 2.776  | 4.604  |
| csiro_mk3_5     | 1 | 2000/09~2100/08 | -0.0007 | -0.0280 | 2.7128  | 2.92   | 4.303  | 9.925  |
| gfdl_cm2_0      | 1 | 2001/01~2100/12 | 0.0009  | 25.1260 | 3.0090  | 2.353  | 3.182  | 5.841  |
| gfdl_cm2_1      | 1 | 2001/01~2100/12 | 2.8607  | 37.1280 | 2.6225  | 2.92   | 4.303  | 9.925  |
| ingv_echam4     | 1 | 2001/01~2100/12 | 0.0007  | 29.5830 | 3.7185  | 2.353  | 3.182  | 5.841  |
| inmcm3_0        | 1 | 2001/01~2200/12 | 2.5525  | -0.0230 | 3.1554  | 2.353  | 3.182  | 5.841  |
| ipsl_cm4        | 1 | 2000/01~2100/12 | 2.5923  | 27.2050 | 3.3505  | 2.353  | 3.182  | 5.841  |
| miroc3_2_medres | 1 | 2001/01~2100/12 | 3.8402  | 42.3380 | 2.5275  | 2.92   | 4.303  | 9.925  |
|                 | 2 |                 | 0.0001  | 58.9960 | 2.6595  | 2.92   | 4.303  | 9.925  |
|                 | 3 |                 | 3.7704  | 59.7890 | 2.5605  | 2.92   | 4.303  | 9.925  |
| mpi_echam5      | 1 | 2001/01~2100/12 | -0.0015 | 26.3560 | 2.9452  | 2.92   | 4.303  | 9.925  |
|                 | 2 |                 | 0.0004  | -0.0380 | 6.0266  | 1.943  | 2.447  | 3.707  |
|                 | 3 |                 | 0.0013  | 33.0090 | 2.6733  | 2.92   | 4.303  | 9.925  |
| mri_cgcm2_3_2a  | 1 | 2000/11~2100/10 | 2.7626  | 39.7790 | 2.7546  | 2.92   | 4.303  | 9.925  |
|                 | 2 |                 | 0.0012  | 57.9900 | 3.4031  | 2.353  | 3.182  | 5.841  |
|                 | 3 |                 | -0.0007 | 32.1260 | 2.6718  | 2.92   | 4.303  | 9.925  |
|                 | 4 |                 | 2.6775  | 43.9900 | 6.7761  | 1.943  | 2.447  | 3.707  |
|                 | 5 |                 | -0.0003 | 40.4500 | 2.9184  | 2.92   | 4.303  | 9.925  |
| ukmo_hadcm3     | 1 | 2000/01~2099/12 | 0.0012  | 0.1950  | 5.0030  | 2.015  | 2.571  | 4.032  |
| miub_echo_g     | 1 | 1999/01~2098/12 | 0.0003  | 3.0940  | 3.8157  | 2.353  | 3.182  | 5.841  |
|                 | 2 |                 | 2.5917  | 1.3820  | 3.8815  | 2.353  | 3.182  | 5.841  |
|                 | 3 |                 | 0.0009  | 0.8860  | 3.2398  | 2.353  | 3.182  | 5.841  |
| ncar_ccsm3_0    | 1 | 1999/09~2099/08 | -0.0003 | 6.1680  | 5.9435  | 2.015  | 2.571  | 4.032  |
|                 | 2 | 1999/09~2099/08 | -0.0012 | 3.2700  | 5.2148  | 2.015  | 2.571  | 4.032  |
|                 | 3 | 1999/09~2099/08 | 2.6493  | 1.6210  | 4.8322  | 2.132  | 2.776  | 4.604  |
|                 | 4 | 1999/09~2099/08 | 0.0007  | 0.8820  | 4.2218  | 2.132  | 2.776  | 4.604  |
|                 | 5 | 1999/09~2089/08 | 0.0000  |         |         |        |        |        |
| ncar_pcm1       | 1 | 缺               | 0.0000  |         |         |        |        |        |
|                 | 2 | 1999/9~2099/8   | 0.0010  | 0.9700  | 3.7546  | 2.353  | 3.182  | 5.841  |
|                 | 3 | 1999/9~2099/8   | -0.0011 | 0.7870  | 6.1164  | 1.943  | 2.447  | 3.707  |
|                 | 4 | 1999/9~2099/8   | 0.0001  | 1.7470  | 4.4158  | 2.132  | 2.776  | 4.604  |
| ukmo_hadgem1    | 1 | 2000/1~2099/11  | 0.0001  | 1.9450  | 2.7000  | 2.92   | 4.303  | 9.925  |

| h1-pr-HA          |         |      |                 | slope   | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-------------------|---------|------|-----------------|---------|---------|---------|--------|--------|--------|
| bccr_bcm2_0       | 128x64  | run1 | 2000/1~2099/12  | -0.0095 | 3.4670  | 15.8253 | 1.753  | 2.131  | 2.947  |
| cccma_cgcm3_1     | 96x48   | run1 | 2000/12~2300/11 | -0.0540 | -0.3750 | 19.9946 | 1.729  | 2.093  | 2.861  |
|                   |         | 2    | 2000/12~2100/11 | 0.7860  | 4.2680  | 19.3724 | 1.729  | 2.093  | 2.861  |
|                   |         | 3    |                 | 0.2744  | 1.9040  | 15.7829 | 1.753  | 2.131  | 2.947  |
|                   |         | 4    |                 | 0.1776  | 1.4870  | 20.6628 | 1.725  | 2.086  | 2.845  |
|                   |         | 5    |                 | 0.0910  | 0.5520  | 14.7470 | 1.761  | 2.145  | 2.977  |
| cccma_cgcm3_1_t63 | 128x64  | run1 | 2000/12~2100/11 | 0.0250  | 3.8280  | 9.3910  | 1.833  | 2.262  | 3.25   |
| cnrm_cm3          | 128x64  | run1 | 2000/1~2149/12  | 0.0364  | 7.2800  | 13.7741 | 1.771  | 2.16   | 3.012  |
| csiro_mk3_0       | 192x96  | run1 | 2000/9~2300/8   | -0.0007 | 0.3240  | 13.9908 | 1.771  | 2.16   | 3.012  |
| csiro_mk3_5       | 192x96  | run1 | 2000/9~2200/8   | -1.1382 | -7.4530 | 18.3884 | 1.734  | 2.101  | 2.878  |
| gfdl_cm2_0        | 144x90  | run1 | 2001/1~2200/12  | -0.0095 | -1.9620 | 14.4664 | 1.761  | 2.145  | 2.977  |
| gfdl_cm2_1        | 144x90  | run1 | 2001/1~2100/12  | -0.0190 | 5.6480  | 17.8157 | 1.74   | 2.11   | 2.898  |
| iap_fgoals1_0_g   | 128x60  | run1 | 1999/12~2199/11 | 1.1189  | 8.6920  | 11.9175 | 1.796  | 2.201  | 3.106  |
|                   |         | 2    |                 | 0.9890  | 9.2260  | 9.5583  | 1.833  | 2.262  | 3.25   |
|                   |         | 3    |                 | 0.1834  | 5.8510  | 8.5729  | 1.86   | 2.306  | 3.355  |
| inmcm3_0          | 72x45   | run1 | 2001/1~2200/12  | 0.4241  | 1.7770  | 11.4239 | 1.796  | 2.201  | 3.106  |
| ipsl_cm4          | 96x72   | run1 | 2000/1~2100/12  | 1.6311  | 17.5550 | 4.6125  | 2.132  | 2.776  | 4.604  |
| miroc3_2_hires    | 320x160 | run1 | 2001/1~2100/12  | 0.2864  | 1.0730  | 12.4585 | 1.782  | 2.179  | 3.055  |
| miroc3_2_medres   | 128x64  | run1 | 2001/1~2300/12  | 0.0630  | 0.9100  | 8.8641  | 1.86   | 2.306  | 3.355  |
|                   |         | 2    | 2001/1~2100/12  | 0.0669  | 8.6530  | 13.0783 | 1.771  | 2.16   | 3.012  |
|                   |         | 3    |                 | 0.0501  | 7.7570  | 15.3830 | 1.753  | 2.131  | 2.947  |
| mpi_echam5        | 192x96  | run1 | 2001/1~2200/12  | -0.0214 | 3.4610  | 10.6985 | 1.812  | 2.228  | 3.169  |
|                   |         | 2    | 2001/1~2100/12  | 0.4475  | 2.3820  | 20.8063 | 1.725  | 2.086  | 2.845  |
|                   |         | 3    | 2001/1~2200/12  | 1.3496  | 7.9550  | 13.0379 | 1.771  | 2.16   | 3.012  |
| mri_cgcm2_3_2a    | 128x64  | run1 | 2000/11~2100/10 | 0.4075  | 6.0130  | 20.7088 | 1.725  | 2.086  | 2.845  |
|                   |         | 2    |                 | 0.0208  | 3.0620  | 18.5461 | 1.734  | 2.101  | 2.878  |
|                   |         | 3    |                 | 0.0023  | 7.0500  | 14.9195 | 1.761  | 2.145  | 2.977  |
|                   |         | 4    |                 | 0.0219  | -2.2320 | 13.6865 | 1.771  | 2.16   | 3.012  |
|                   |         | 5    |                 | 0.0175  | 3.9300  | 14.9590 | 1.761  | 2.145  | 2.977  |
| ukmo_hadcm3       | 96x73   | run1 | 2000/1~2199/12  | 0.0139  | 4.4450  | 18.7015 | 1.734  | 2.101  | 2.878  |
| miub_echo_g       | 96x48   | run1 | 1999/1~2198/12  | -0.0514 | -3.1070 | 18.8394 | 1.734  | 2.101  | 2.878  |
|                   |         | 2    |                 | -0.0035 | -0.2580 | 6.7038  | 1.943  | 2.447  | 3.707  |
|                   |         | 3    |                 | -0.0622 | -6.2480 | 17.7422 | 1.74   | 2.11   | 2.898  |
| ncar_ccsm3_0      | 256x128 | run1 | 1999/9~2099/8   | 0.0228  | 3.2830  | 8.4609  | 1.86   | 2.306  | 3.355  |
|                   |         | 2    |                 | 0.0516  | 7.2870  | 10.4583 | 1.812  | 2.228  | 3.169  |
|                   |         | 3    |                 | 0.0042  | 0.6940  | 18.7325 | 1.734  | 2.101  | 2.878  |
|                   |         | 4    |                 | 0.0372  | 9.6880  | 13.6284 | 1.771  | 2.16   | 3.012  |
|                   |         | 5    |                 | 0.0329  | 4.9740  | 23.1395 | 1.714  | 2.069  | 2.807  |
|                   |         | 6    |                 | 0.1521  | 2.1660  | 13.6188 | 1.771  | 2.16   | 3.012  |
|                   |         | 7    |                 | 0.0229  | 2.1540  | 14.7466 | 1.761  | 2.145  | 2.977  |
|                   |         | 8    |                 | 0.0298  | 5.0020  | 14.5738 | 1.761  | 2.145  | 2.977  |
|                   |         | 9    |                 | -0.0273 | -4.2380 | 14.5404 | 1.761  | 2.145  | 2.977  |
| ncar_pcm1         | 128x64  | run1 | 2199/7~2299/6   |         |         |         |        |        |        |
|                   |         | 2    | 1999/9~2199/8   | 0.0325  | 8.8950  | 11.6000 | 1.796  | 2.201  | 3.106  |
|                   |         | 3    |                 | 0.1322  | 5.0350  | 12.5881 | 1.782  | 2.179  | 3.055  |
|                   |         | 4    | 2099/11~2200/7  |         |         |         |        |        |        |



| a2-pr-IIA       |         |      |                 | slope   | t-value  | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-----------------|---------|------|-----------------|---------|----------|---------|--------|--------|--------|
| bccr_bcm2_0     | 128x64  | run1 | 2000/1~2099/12  | 0.0241  | 7.4240   | 14.5224 | 1.761  | 2.145  | 2.977  |
| cccma_cgcm3_1   | 96x48   | run1 | 2000/12~2100/11 | -0.7650 | 7.7680   | 15.0349 | 1.753  | 2.131  | 2.947  |
|                 |         | 2    |                 | 0.1897  | 8.2360   | 11.4136 | 1.796  | 2.201  | 3.106  |
|                 |         | 3    |                 | 0.0587  | 5.7280   | 20.4076 | 1.725  | 2.086  | 2.845  |
|                 |         | 4    |                 | -0.4729 | 1.4410   | 22.6180 | 1.717  | 2.074  | 2.819  |
|                 |         | 5    |                 | 0.0422  | 4.5900   | 17.6872 | 1.74   | 2.11   | 2.898  |
| cnrm_cm3        | 128x64  | run1 | 2000/1~2099/12  | 1.4287  | -1.8740  | 14.8774 | 1.761  | 2.145  | 2.977  |
| csiro_mk3_0     | 192x96  | run1 | 2000/9~2100/8   | -0.4722 | 8.1430   | 29.9345 | 1.699  | 2.045  | 2.756  |
| csiro_mk3_5     | 192x96  | run1 | 2000/9~2100/8   | 0.0928  | 2.2400   | 18.9314 | 1.734  | 2.101  | 2.878  |
| gfdl_cm2_0      | 144x90  | run1 | 2001/1~2100/12  | 0.0163  | 2.9200   | 23.7102 | 1.714  | 2.069  | 2.807  |
| gfdl_cm2_1      | 144x90  | run1 | 2001/1~2100/12  | 0.8183  | 4.9040   | 9.0250  | 1.833  | 2.262  | 3.25   |
| ingv_echam4     | 320x160 | run1 | 2001/1~2100/12  | 0.3278  | 2.0110   | 13.5705 | 1.771  | 2.16   | 3.012  |
| inmcm3_0        | 72x45   | run1 | 2001/1~2200/12  | 0.2140  | 8.3120   | 12.0860 | 1.782  | 2.179  | 3.055  |
| ipsl_cm4        | 96x72   | run1 | 2000/1~2100/12  | 0.0325  | 5.4710   | 9.3176  | 1.833  | 2.262  | 3.25   |
| miroc3_2_medres | 128x64  | run1 | 2001/1~2100/12  | 0.1284  | 28.7940  | 2.9387  | 2.92   | 4.303  | 9.925  |
|                 |         | 2    |                 | 0.1047  | 14.5040  | 20.5921 | 1.725  | 2.086  | 2.845  |
|                 |         | 3    |                 | -0.0427 | -0.2380  | 25.2979 | 1.708  | 2.06   | 2.787  |
| mpi_echam5      | 192x96  | run1 | 2001/1~2100/12  | 1.5610  | 1.3200   | 15.7857 | 1.753  | 2.131  | 2.947  |
|                 |         | 2    |                 | 2.3516  | -0.3920  | 6.2586  | 1.943  | 2.447  | 3.707  |
|                 |         | 3    |                 | -0.0031 | -0.4140  | 26.0663 | 1.706  | 2.056  | 2.779  |
| mri_cgcm2_3_2a  | 128x64  | run1 | 2000/11~2100/10 | 0.0285  | 5.2990   | 17.0258 | 1.74   | 2.11   | 2.898  |
|                 |         | 2    |                 | -0.0398 | -4.2530  | 19.5021 | 1.729  | 2.093  | 2.861  |
|                 |         | 3    |                 | 0.7984  | 0.2850   | 14.6310 | 1.761  | 2.145  | 2.977  |
|                 |         | 4    |                 | 0.0146  | 1.2550   | 13.1598 | 1.771  | 2.16   | 3.012  |
|                 |         | 5    |                 | 0.0311  | 3.0760   | 19.2564 | 1.729  | 2.093  | 2.861  |
| ukmo_hadcm3     | 96x73   | run1 | 2000/1~2099/12  | 0.0666  | 10.1270  | 7.9705  | 1.895  | 2.365  | 3.499  |
| miub_echo_g     | 96x48   | run1 | 1999/1~2098/12  | -0.0476 | -3.6400  | 8.4583  | 1.86   | 2.306  | 3.355  |
|                 |         | 2    |                 | 0.0101  | 1.0500   | 13.6197 | 1.771  | 2.16   | 3.012  |
|                 |         | 3    |                 | 0.5142  | -12.5430 | 8.3071  | 1.86   | 2.306  | 3.355  |
| ncar_ccsm3_0    | 256x128 | run1 | 1999/9~2099/8   | 0.0805  | 10.7400  | 7.4010  | 1.895  | 2.365  | 3.499  |
|                 |         | 2    | 1999/9~2099/8   | 0.0814  | 11.6290  | 8.1900  | 1.86   | 2.306  | 3.355  |
|                 |         | 3    | 1999/9~2099/8   | 0.0975  | 9.8260   | 9.9295  | 1.833  | 2.262  | 3.25   |
|                 |         | 4    | 1999/9~2099/8   | 0.0917  | 9.8170   | 5.0252  | 2.015  | 2.571  | 4.032  |
|                 |         | 5    | 1999/9~2089/8   | 0.0000  |          |         |        |        |        |
| ncar_pcm1       | 128x64  | run1 | 缺               | 0.0000  |          |         |        |        |        |
|                 |         | 2    | 1999/9~2099/8   | 0.0386  | 3.6260   | 8.7729  | 1.86   | 2.306  | 3.355  |
|                 |         | 3    | 1999/9~2099/8   | 0.3552  | 3.8360   | 11.0177 | 1.796  | 2.201  | 3.106  |
|                 |         | 4    | 1999/9~2099/8   | 0.0604  | 1.5090   | 10.4615 | 1.812  | 2.228  | 3.169  |
| ukmo_hadgem1    | 192x145 | run1 | 2000/1~2099/11  | 0.0522  | 8.3390   | 12.7320 | 1.782  | 2.179  | 3.055  |

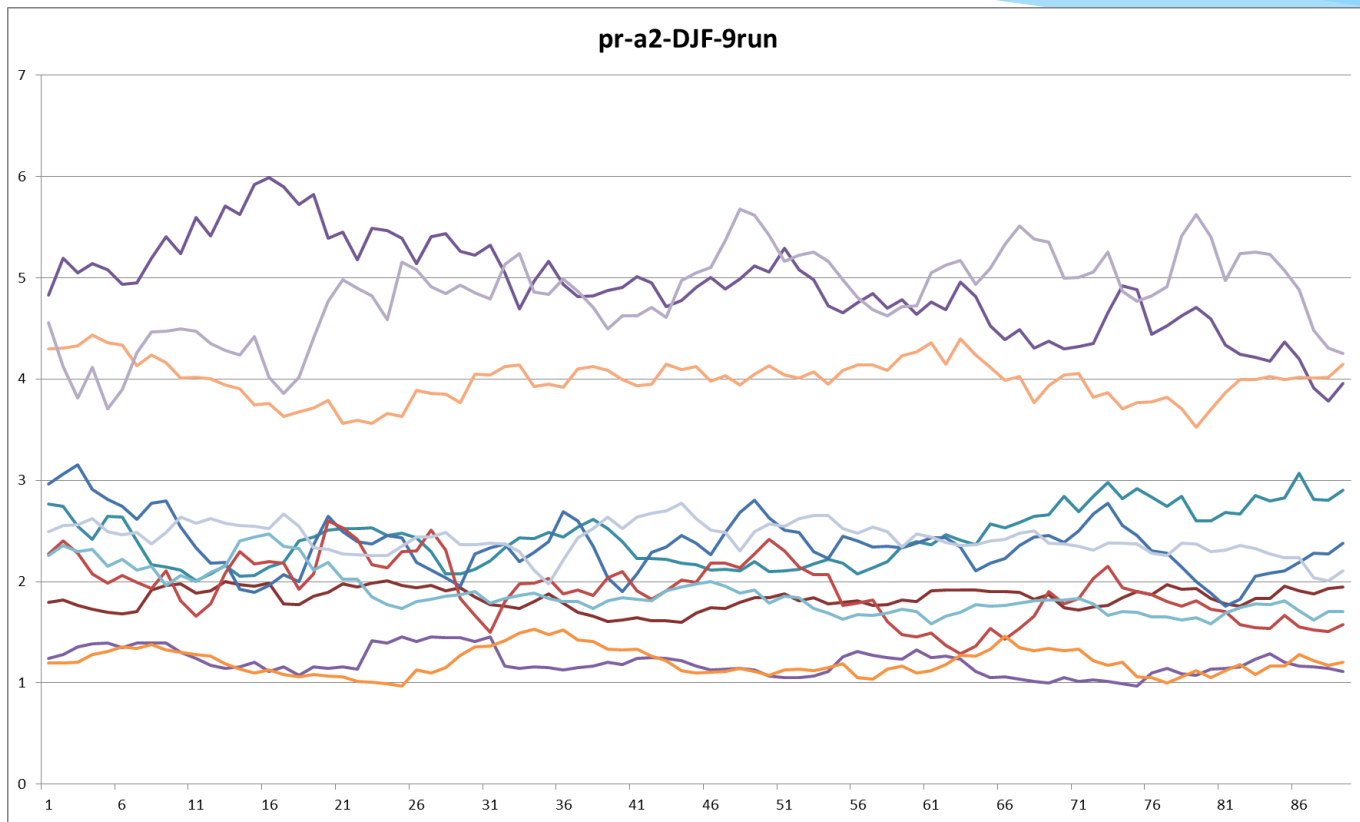
| t1                |         |      | pr-DJF          | slope   | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-------------------|---------|------|-----------------|---------|---------|---------|--------|--------|--------|
| bccr_bcm2_0       | 128x64  | run1 | 2000/1~2099/12  | 0.1286  | 0.9350  | 27.9537 | 1.703  | 2.052  | 2.771  |
| cccma_cgcm3_1     | 96x48   | run1 | 2000/12~2300/11 | 0.0000  | 1.0350  | 20.6173 | 1.725  | 2.086  | 2.845  |
|                   |         | 2    | 2000/12~2100/11 | 0.1461  | 2.5800  | 22.0300 | 1.717  | 2.074  | 2.819  |
|                   |         | 3    |                 | 0.0000  | -2.2010 | 16.0733 | 1.746  | 2.12   | 2.921  |
|                   |         | 4    |                 | 0.2076  | 4.0260  | 13.6558 | 1.771  | 2.16   | 3.012  |
|                   |         | 5    |                 | 0.0000  | 0.8560  | 20.0787 | 1.725  | 2.086  | 2.845  |
| cccma_cgcm3_1_t63 | 128x64  | run1 | 2000/12~2100/11 | 0.0000  | 0.5910  | 4.8747  | 2.132  | 2.776  | 4.604  |
| cnrm_cm3          | 128x64  | run1 | 2000/1~2149/12  | 0.0000  | -0.0620 | 4.0261  | 2.132  | 2.776  | 4.604  |
| csiro_mk3_0       | 192x96  | run1 | 2000/9~2300/8   | 0.0000  | 2.2100  | 28.9410 | 1.701  | 2.048  | 2.763  |
| csiro_mk3_5       | 192x96  | run1 | 2000/9~2200/8   | 0.0000  | -1.2430 | 17.5072 | 1.74   | 2.11   | 2.898  |
| gfdl_cm2_0        | 144x90  | run1 | 2001/1~2200/12  | 0.0000  | 4.7430  | 19.1603 | 1.729  | 2.093  | 2.861  |
| gfdl_cm2_1        | 144x90  | run1 | 2001/1~2100/12  | 0.0000  | 11.8330 | 8.1179  | 1.86   | 2.306  | 3.355  |
| iap_fgoals1_0_g   | 128x60  | run1 | 1999/12~2199/11 | 0.0000  | 0.2020  | 4.0775  | 2.132  | 2.776  | 4.604  |
|                   |         | 2    |                 | 0.2823  | 3.3970  | 20.5232 | 1.725  | 2.086  | 2.845  |
|                   |         | 3    |                 | 0.1160  | 1.3800  | 9.8792  | 1.833  | 2.262  | 3.25   |
| inmcm3_0          | 72x45   | run1 | 2001/1~2200/12  | 0.0902  | 0.6450  | 16.4891 | 1.746  | 2.12   | 2.921  |
| ipsl_cm4          | 96x72   | run1 | 2000/1~2100/12  | -0.3495 | -3.1000 | 14.0712 | 1.761  | 2.145  | 2.977  |
| miroc3_2_hires    | 320x160 | run1 | 2001/1~2100/12  | 0.0000  | 0.5200  | 4.9751  | 2.132  | 2.776  | 4.604  |
| miroc3_2_medres   | 128x64  | run1 | 2001/1~2300/12  | 0.0000  | -5.9720 | 14.6043 | 1.761  | 2.145  | 2.977  |
|                   |         | 2    | 2001/1~2100/12  | 0.0000  | 7.4380  | 17.3413 | 1.74   | 2.11   | 2.898  |
|                   |         | 3    |                 | 0.0000  | -3.1800 | 12.2996 | 1.782  | 2.179  | 3.055  |
| mpi_echam5        | 192x96  | run1 | 2001/1~2200/12  | 0.0000  | -7.1550 | 15.6366 | 1.753  | 2.131  | 2.947  |
|                   |         | 2    | 2001/1~2100/12  | 0.0000  | 2.0910  | 19.6037 | 1.729  | 2.093  | 2.861  |
|                   |         | 3    | 2001/1~2200/12  | 0.0000  | -0.2790 | 21.7379 | 1.721  | 2.08   | 2.831  |
| mri_cgcm2_3_2a    | 128x64  | run1 | 2000/11~2100/10 | 0.0000  | 3.7890  | 10.8141 | 1.812  | 2.228  | 3.169  |
|                   |         | 2    |                 | 0.0159  | 0.4230  | 19.1009 | 1.729  | 2.093  | 2.861  |
|                   |         | 3    |                 | 0.0000  | -1.8540 | 17.2862 | 1.74   | 2.11   | 2.898  |
|                   |         | 4    |                 | 0.0000  | -3.3430 | 11.2729 | 1.796  | 2.201  | 3.106  |
|                   |         | 5    |                 | -0.1888 | -3.9390 | 15.1342 | 1.753  | 2.131  | 2.947  |
| ukmo_hadcm3       | 96x73   | run1 | 2000/1~2199/12  | 0.0000  | -0.6590 | 23.1529 | 1.714  | 2.069  | 2.807  |
| miub_echo_g       | 96x48   | run1 | 1999/1~2198/12  | -0.3862 | 3.1010  | 14.3873 | 1.761  | 2.145  | 2.977  |
|                   |         | 2    |                 | 0.0000  | 6.5650  | 14.7606 | 1.761  | 2.145  | 2.977  |
|                   |         | 3    |                 | 0.0000  | 3.0360  | 4.4257  | 2.132  | 2.776  | 4.604  |
| ncar_ccsm3_0      | 256x128 | run1 | 1999/9~2099/8   | 0.0000  | 3.2460  | 4.1743  | 2.132  | 2.776  | 4.604  |
|                   |         | 2    |                 | 0.0000  | 5.9850  | 4.1790  | 2.132  | 2.776  | 4.604  |
|                   |         | 3    |                 | 0.0000  | 1.4950  | 3.2373  | 2.353  | 3.182  | 5.841  |
|                   |         | 4    |                 | -0.2074 | -1.3740 | 4.3169  | 2.132  | 2.776  | 4.604  |
|                   |         | 5    |                 | 0.0000  | 6.8650  | 4.9580  | 2.132  | 2.776  | 4.604  |
|                   |         | 6    |                 | 0.0000  | 1.5160  | 4.6151  | 2.132  | 2.776  | 4.604  |
|                   |         | 7    |                 | 0.0000  | 8.0280  | 5.4585  | 2.015  | 2.571  | 4.032  |
|                   |         | 8    |                 | 0.0000  | 2.2880  | 4.5999  | 2.132  | 2.776  | 4.604  |
|                   |         | 9    |                 | 0.0000  | 6.4120  | 4.8943  | 2.132  | 2.776  | 4.604  |
| ncar_pcm1         | 128x64  | run1 | 2199/7~2299/6   |         |         |         |        |        |        |
|                   |         | 2    | 1999/9~2199/8   | 0.0000  | 4.6240  | 4.4825  | 2.132  | 2.776  | 4.604  |
|                   |         | 3    |                 | 0.5663  | 1.1090  | 6.5885  | 1.943  | 2.447  | 3.707  |
|                   |         | 4    | 2099/11~2200/7  |         |         |         |        |        |        |

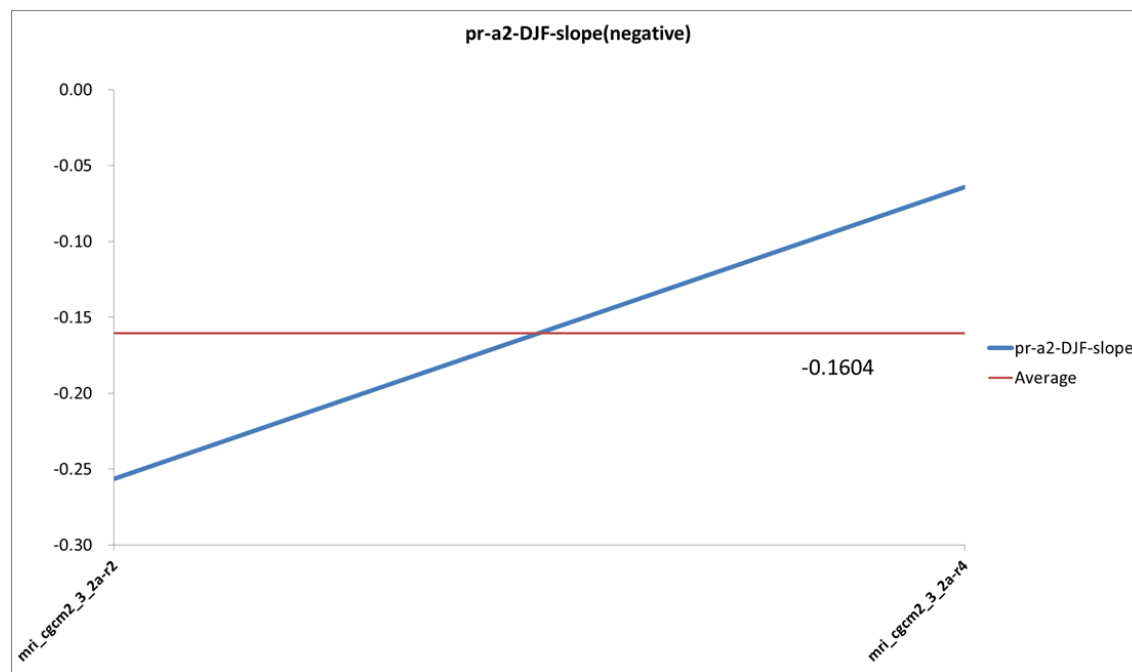
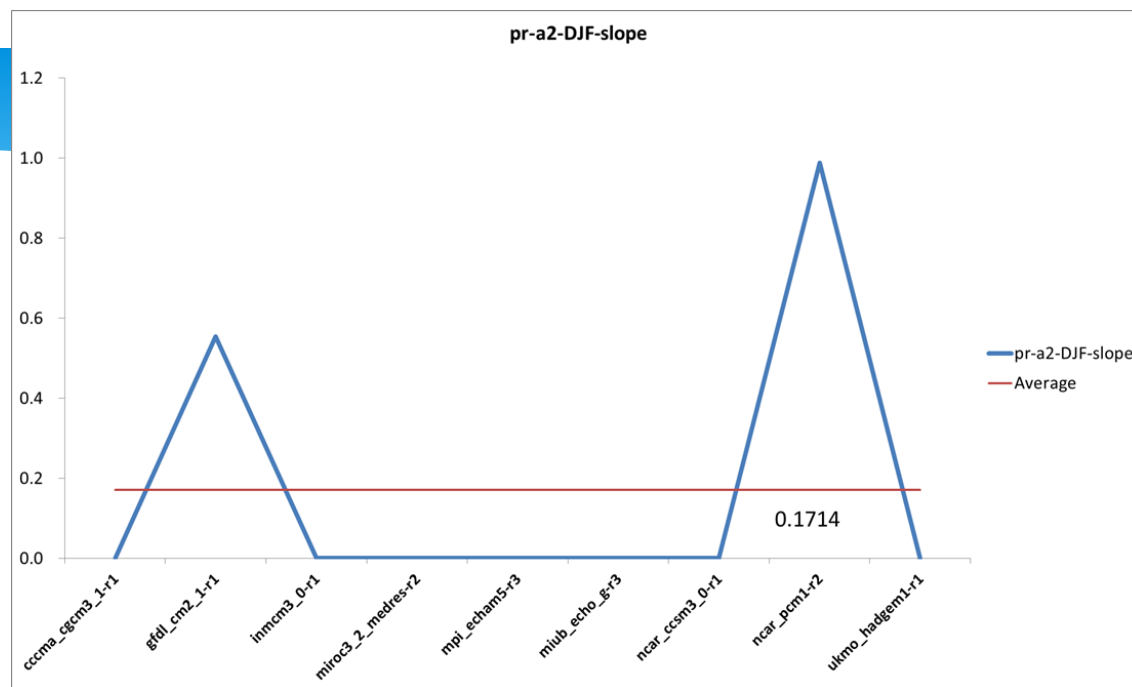
|  |                   |         | a1b-pr-DJF |                 | slope   | t-value | EDF     | 0.0500 | 0.0250 | 0.0050 |
|--|-------------------|---------|------------|-----------------|---------|---------|---------|--------|--------|--------|
|  | bccr_bcm2_0       | 128x64  | run1       | 2000/1~2099/12  | -0.3862 | 0.5540  | 23.6947 | 1.714  | 2.069  | 2.807  |
|  | cccma_cgcm3_1     | 96x48   | run1       | 2000/12~2100/11 | -0.0858 | -1.8790 | 16.3038 | 1.746  | 2.12   | 2.921  |
|  |                   |         | 2          |                 | 0.2057  | 4.1060  | 17.3238 | 1.74   | 2.11   | 2.898  |
|  |                   |         | 3          |                 | 0.1518  | 0.9770  | 11.6246 | 1.796  | 2.201  | 3.106  |
|  |                   |         | 4          |                 | -0.2020 | -3.9140 | 12.7947 | 1.782  | 2.179  | 3.055  |
|  |                   |         | 5          |                 | -0.1279 | 0.0480  | 20.6612 | 1.725  | 2.086  | 2.845  |
|  | cccma_cgcm3_1_t63 | 128x64  | run1       | 2000/12~2100/11 | -0.0741 | -1.7490 | 20.4034 | 1.725  | 2.086  | 2.845  |
|  | cnrm_cm3          | 128x64  | run1       | 2000/1~2299/12  | -0.2613 | -2.1610 | 22.1167 | 1.717  | 2.074  | 2.819  |
|  | csiro_mk3_0       | 192x96  | run1       | 2000/9~2200/8   | -1.2397 | 0.6260  | 10.6934 | 1.812  | 2.228  | 3.169  |
|  | csiro_mk3_5       | 192x96  | run1       | 2000/9~2100/8   | 0.2442  | 0.2730  | 25.7806 | 1.7080 | 2.0600 | 2.7870 |
|  | gfdl_cm2_0        | 144x90  | run1       | 2001/1~2200/12  | 0.0123  | 0.1110  | 17.5094 | 1.74   | 2.11   | 2.898  |
|  | gfdl_cm2_1        | 144x90  | run1       | 2001/1~2100/12  | 0.2006  | 1.5240  | 16.4720 | 1.746  | 2.12   | 2.921  |
|  | giss_model_e_h    | 72x46   | run1       | 2000/1~2099/12  | -0.3071 | -0.0160 | 16.9267 | 1.746  | 2.12   | 2.921  |
|  |                   |         | 2          |                 | -0.1692 | 0.0710  | 16.0068 | 1.746  | 2.12   | 2.921  |
|  |                   |         | 3          |                 | -0.0992 | -0.9430 | 15.3077 | 1.753  | 2.131  | 2.947  |
|  | iap_fgoals1_0_g   | 128x60  | run1       | 1999/12~2199/11 | 0.2609  | 0.0680  | 22.8520 | 1.717  | 2.074  | 2.819  |
|  |                   |         | 2          |                 | 0.1181  | 1.4290  | 18.1965 | 1.734  | 2.101  | 2.878  |
|  |                   |         | 3          |                 | 0.4244  | 4.7140  | 14.8136 | 1.761  | 2.145  | 2.977  |
|  | ingv_echam4       | 320x160 | run1       | 2001/1~2100/12  | -0.0869 | -0.8330 | 18.8682 | 1.734  | 2.101  | 2.878  |
|  | inmcm3_0          | 72x45   | run1       | 2001/1~2200/12  | -0.2043 | 0.1070  | 11.8077 | 1.796  | 2.201  | 3.106  |
|  | ipsl_cm4          | 96x72   | run1       | 2000/1~2100/12  | -0.6216 | -1.9810 | 16.8152 | 1.746  | 2.12   | 2.921  |
|  | miroc3_2_hires    | 320x160 | run1       | 2001/1~2100/12  | -0.5138 | 0.2320  | 14.4562 | 1.761  | 2.145  | 2.977  |
|  | miroc3_2_medres   | 128x64  | run1       | 2001/1~2300/12  | -0.8671 | -6.9070 | 12.4390 | 1.782  | 2.179  | 3.055  |
|  |                   |         | 2          | 2001/1~2100/12  | -0.4596 | -3.9150 | 28.9798 | 1.7010 | 2.0480 | 2.7630 |
|  |                   |         | 3          |                 | -0.4672 | 0.1340  | 15.8021 | 1.753  | 2.131  | 2.947  |
|  | mpi_echam5        | 192x96  | run1       | 2001/1~2200/12  | 0.1463  | -0.0620 | 8.2770  | 1.86   | 2.306  | 3.355  |
|  |                   |         | 2          | 2001/1~2300/12  | 0.0000  | -0.1580 | 17.8127 | 1.74   | 2.11   | 2.898  |
|  |                   |         | 3          | 2001/1~2200/12  | 0.0000  | 0.2430  | 12.6760 | 1.782  | 2.179  | 3.055  |
|  |                   |         | 4          | 2001/1~2100/12  | 0.4943  | -0.0840 | 23.3931 | 1.714  | 2.069  | 2.807  |
|  | mri_cgcm2_3_2a    | 128x64  | run1       | 2000/11~2100/10 | -0.1378 | -2.2940 | 18.6389 | 1.734  | 2.101  | 2.878  |
|  |                   |         | 2          |                 | 0.0000  | -0.0950 | 8.8834  | 1.86   | 2.306  | 3.355  |
|  |                   |         | 3          |                 | 0.0000  | -0.1410 | 14.2184 | 1.761  | 2.145  | 2.977  |
|  |                   |         | 4          |                 | -0.0519 | -1.3960 | 16.7465 | 1.746  | 2.12   | 2.921  |
|  |                   |         | 5          |                 | -0.1447 | -2.9080 | 11.3424 | 1.796  | 2.201  | 3.106  |
|  | ukmo_hadcm3       | 96x73   | run1       | 2000/1~2199/11  | 0.0000  | -3.4250 | 22.8601 | 1.717  | 2.074  | 2.819  |
|  | miub_echo_g       | 96x48   | run1       | 1999/1~2298/12  | 0.0000  | 1.9450  | 4.1197  | 2.132  | 2.776  | 4.604  |
|  |                   |         | 2          | 1999/1~2198/12  | 0.0000  | -0.3910 | 4.5798  | 2.132  | 2.776  | 4.604  |
|  |                   |         | 3          |                 | 0.0000  | 9.3120  | 10.4248 | 1.812  | 2.228  | 3.169  |
|  | ncar_ccsm3_0      | 256x128 | run1       | 1999/9~2099/8   | 0.7659  | 7.1630  | 17.4605 | 1.74   | 2.11   | 2.898  |
|  |                   |         | 2          |                 | 0.0000  | 2.3720  | 16.1590 | 1.746  | 2.12   | 2.921  |
|  |                   |         | 3          |                 | 0.0838  | 0.6220  | 4.1702  | 2.132  | 2.776  | 4.604  |
|  |                   |         | 4          |                 | 0.0000  |         |         |        |        |        |
|  |                   |         | 5          | 1999/9~2099/8   | 0.0000  | 5.8090  | 5.5305  | 2.015  | 2.571  | 4.032  |
|  |                   |         | 6          |                 | 0.0000  | 0.7210  | 17.8424 | 1.74   | 2.11   | 2.898  |
|  |                   |         | 7          |                 | 0.0000  | 3.0740  | 2.9548  | 2.92   | 4.303  | 9.925  |
|  |                   |         | 8          |                 | 0.0000  |         |         |        |        |        |
|  |                   |         | 9          | 1999/9~2099/8   | 0.0000  | 1.4550  | 4.6891  | 2.132  | 2.776  | 4.604  |
|  | ncar_pcm1         | 128x64  | run1       | 1999/9~2099/6   | 0.0000  | 3.5040  | 3.4079  | 2.353  | 3.182  | 5.841  |
|  |                   |         | 2          | 缺               | 0.0000  |         |         |        |        |        |
|  |                   |         | 3          | 1999/9~2199/8   | 0.0000  | 6.9290  | 15.1699 | 1.753  | 2.131  | 2.947  |
|  |                   |         | 4          | 1999/9~2099/8   | 0.0000  | 2.1290  | 3.9889  | 2.353  | 3.182  | 5.841  |
|  | ukmo_hadgem1      | 192x145 | run1       | 2000/1~2099/11  | 0.0000  | 2.8180  | 3.9831  | 2.353  | 3.182  | 5.841  |

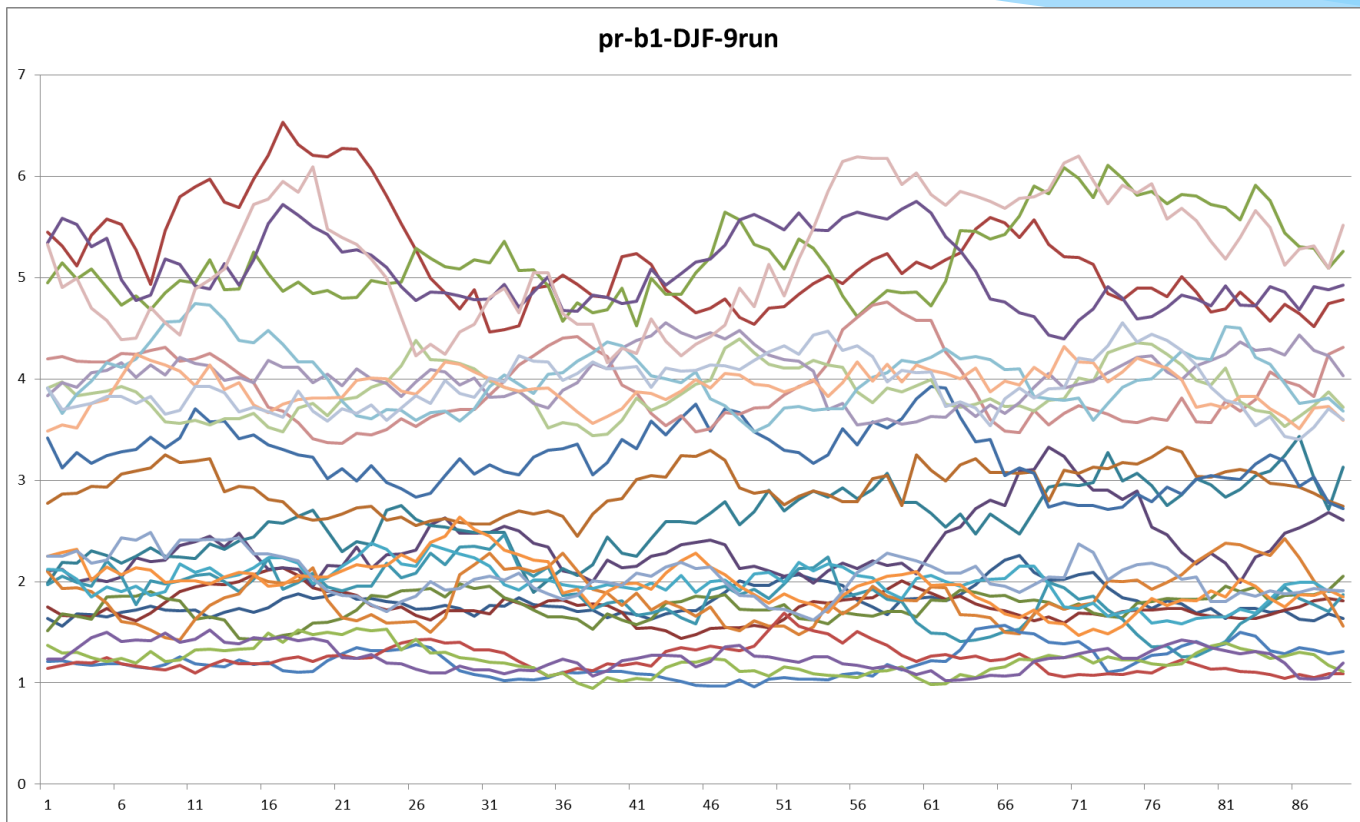


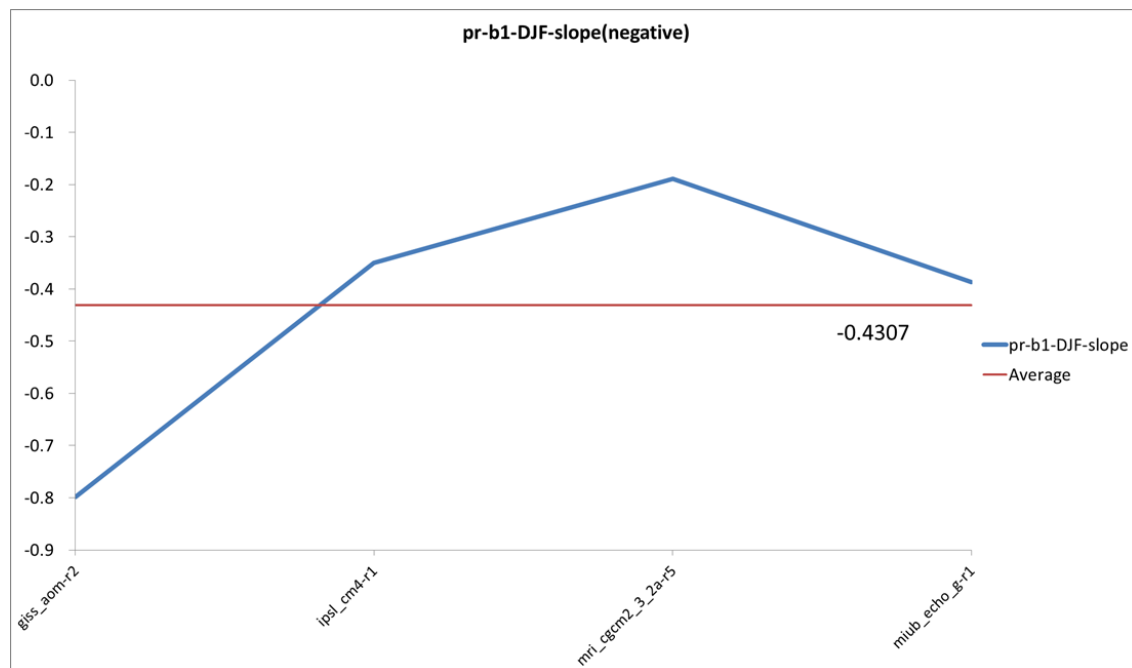
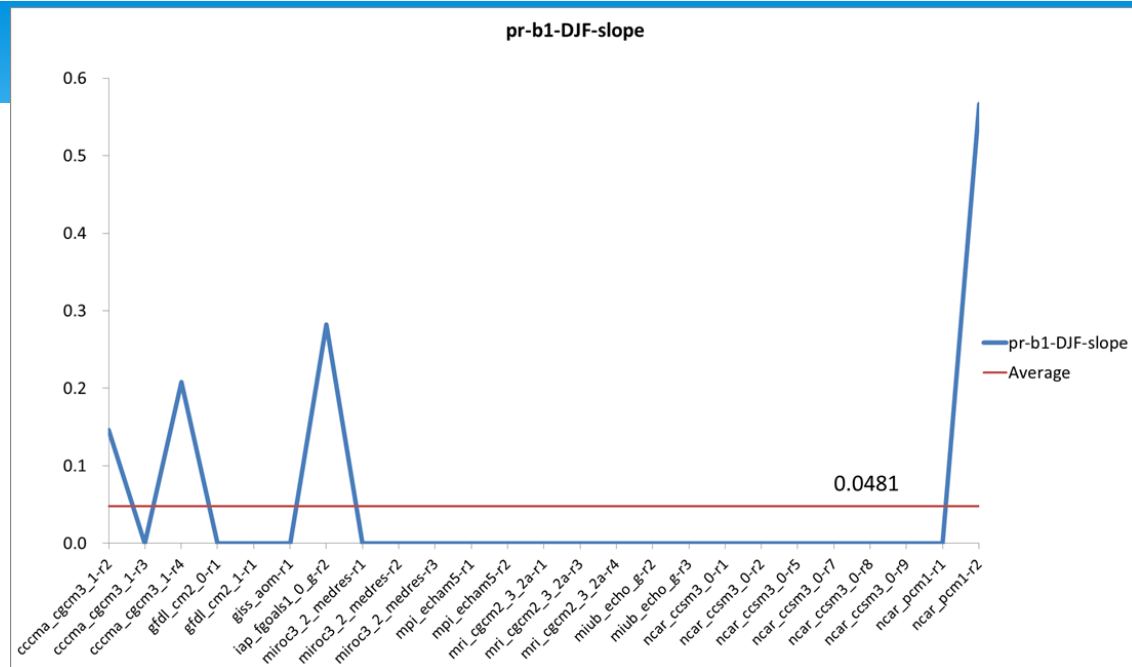
| a2-pr-DIF       |         |      |                 | slope   | t-value  | EDF     | 0.0500 | 0.0250 | 0.0050 |
|-----------------|---------|------|-----------------|---------|----------|---------|--------|--------|--------|
| bccr_bcm2_0     | 128x64  | run1 | 2000/1~2099/12  | -0.5624 | -0.3270  | 17.9842 | 1.74   | 2.11   | 2.898  |
| cccma_cgcm3_1   | 96x48   | run1 | 2000/12~2100/11 | 0.0000  | 4.6510   | 18.7911 | 1.734  | 2.101  | 2.878  |
|                 |         | 2    |                 | 0.0000  | 0.1500   | 14.6812 | 1.761  | 2.145  | 2.977  |
|                 |         | 3    |                 | 0.0198  | 0.2370   | 25.2434 | 1.708  | 2.06   | 2.787  |
|                 |         | 4    |                 | -0.0841 | 0.1880   | 10.7430 | 1.812  | 2.228  | 3.169  |
|                 |         | 5    |                 | 0.1275  | 0.5870   | 17.0467 | 1.74   | 2.11   | 2.898  |
| cnrm_cm3        | 128x64  | run1 | 2000/1~2099/12  | -0.5435 | 0.3780   | 8.7143  | 1.86   | 2.306  | 3.355  |
| csiro_mk3_0     | 192x96  | run1 | 2000/9~2100/8   | 0.0000  | -0.0220  | 15.3976 | 1.753  | 2.131  | 2.947  |
| csiro_mk3_5     | 192x96  | run1 | 2000/9~2100/8   | 0.0000  | -0.0990  | 10.1872 | 1.812  | 2.228  | 3.169  |
| gfdl_cm2_0      | 144x90  | run1 | 2001/1~2100/12  | 0.0815  | -0.0870  | 13.6860 | 1.7710 | 2.1600 | 3.0120 |
| gfdl_cm2_1      | 144x90  | run1 | 2001/1~2100/12  | 0.5544  | 5.8460   | 14.0724 | 1.761  | 2.145  | 2.977  |
| ingv_echam4     | 320x160 | run1 | 2001/1~2100/12  | -0.7292 | 0.0740   | 15.9312 | 1.753  | 2.131  | 2.947  |
| inmcm3_0        | 72x45   | run1 | 2001/1~2200/12  | 0.0000  | -3.0730  | 24.6040 | 1.711  | 2.064  | 2.797  |
| ipsl_cm4        | 96x72   | run1 | 2000/1~2100/12  | 0.0000  | 0.1190   | 8.4314  | 1.86   | 2.306  | 3.355  |
| miroc3_2_medres | 128x64  | run1 | 2001/1~2100/12  | -0.3248 | -0.1820  | 15.3139 | 1.753  | 2.131  | 2.947  |
|                 |         | 2    |                 | 0.0000  | -13.4270 | 5.9531  | 2.015  | 2.571  | 4.032  |
|                 |         | 3    |                 | 0.0000  | -0.1640  | 11.1126 | 1.796  | 2.201  | 3.106  |
| mpi_echam5      | 192x96  | run1 | 2001/1~2100/12  | 0.0504  | 0.5420   | 15.5513 | 1.753  | 2.131  | 2.947  |
|                 |         | 2    |                 | -0.5072 | 0.2420   | 17.4721 | 1.74   | 2.11   | 2.898  |
|                 |         | 3    |                 | 0.0000  | 4.6510   | 12.1524 | 1.782  | 2.179  | 3.055  |
| mri_cgcm2_3_2a  | 128x64  | run1 | 2000/11~2100/10 | 0.0000  | -0.2330  | 18.1468 | 1.734  | 2.101  | 2.878  |
|                 |         | 2    |                 | -0.2565 | -4.6510  | 16.4459 | 1.746  | 2.12   | 2.921  |
|                 |         | 3    |                 | 0.0000  | 0.2660   | 13.2502 | 1.771  | 2.16   | 3.012  |
|                 |         | 4    |                 | -0.0643 | 4.6510   | 8.9385  | 1.86   | 2.306  | 3.355  |
|                 |         | 5    |                 | 0.0000  | -0.0220  | 5.3508  | 2.015  | 2.571  | 4.032  |
| ukmo_hadcm3     | 96x73   | run1 | 2000/1~2099/12  | 0.0000  | -0.0730  | 5.2380  | 2.0150 | 2.5710 | 4.0320 |
| miub_echo_g     | 96x48   | run1 | 1999/1~2098/12  | 0.0000  | 1.6480   | 5.5143  | 2.015  | 2.571  | 4.032  |
|                 |         | 2    |                 | 0.0000  | 1.6050   | 3.8175  | 2.353  | 3.182  | 5.841  |
|                 |         | 3    |                 | 0.0000  | 3.1130   | 4.5489  | 2.132  | 2.776  | 4.604  |
| ncar_ccsm3_0    | 256x128 | run1 | 1999/9~2099/8   | 0.0000  | 3.6090   | 4.4655  | 2.132  | 2.776  | 4.604  |
|                 |         | 2    | 1999/9~2099/8   | 0.0000  | 1.2600   | 3.7444  | 2.353  | 3.182  | 5.841  |
|                 |         | 3    | 1999/9~2099/8   | 0.0000  | 1.5340   | 4.6659  | 2.132  | 2.776  | 4.604  |
|                 |         | 4    | 1999/9~2099/8   | 0.0000  | 1.1000   | 4.2053  | 2.132  | 2.776  | 4.604  |
|                 |         | 5    | 1999/9~2089/8   | 0.0000  |          |         |        |        |        |
| ncar_pcm1       | 128x64  | run1 | 缺               | 0.0000  |          |         |        |        |        |
|                 |         | 2    | 1999/9~2099/8   | 0.9880  | 6.7320   | 18.1641 | 1.734  | 2.101  | 2.878  |
|                 |         | 3    | 1999/9~2099/8   | 0.0000  | -1.4320  | 4.3029  | 2.132  | 2.776  | 4.604  |
|                 |         | 4    | 1999/9~2099/8   | 0.0000  | 2.2390   | 3.7108  | 2.353  | 3.182  | 5.841  |
| ukmo_hadgem1    | 192x145 | run1 | 2000/1~2099/11  | 0.0000  | 1.7320   | 21.3286 | 1.721  | 2.08   | 2.831  |

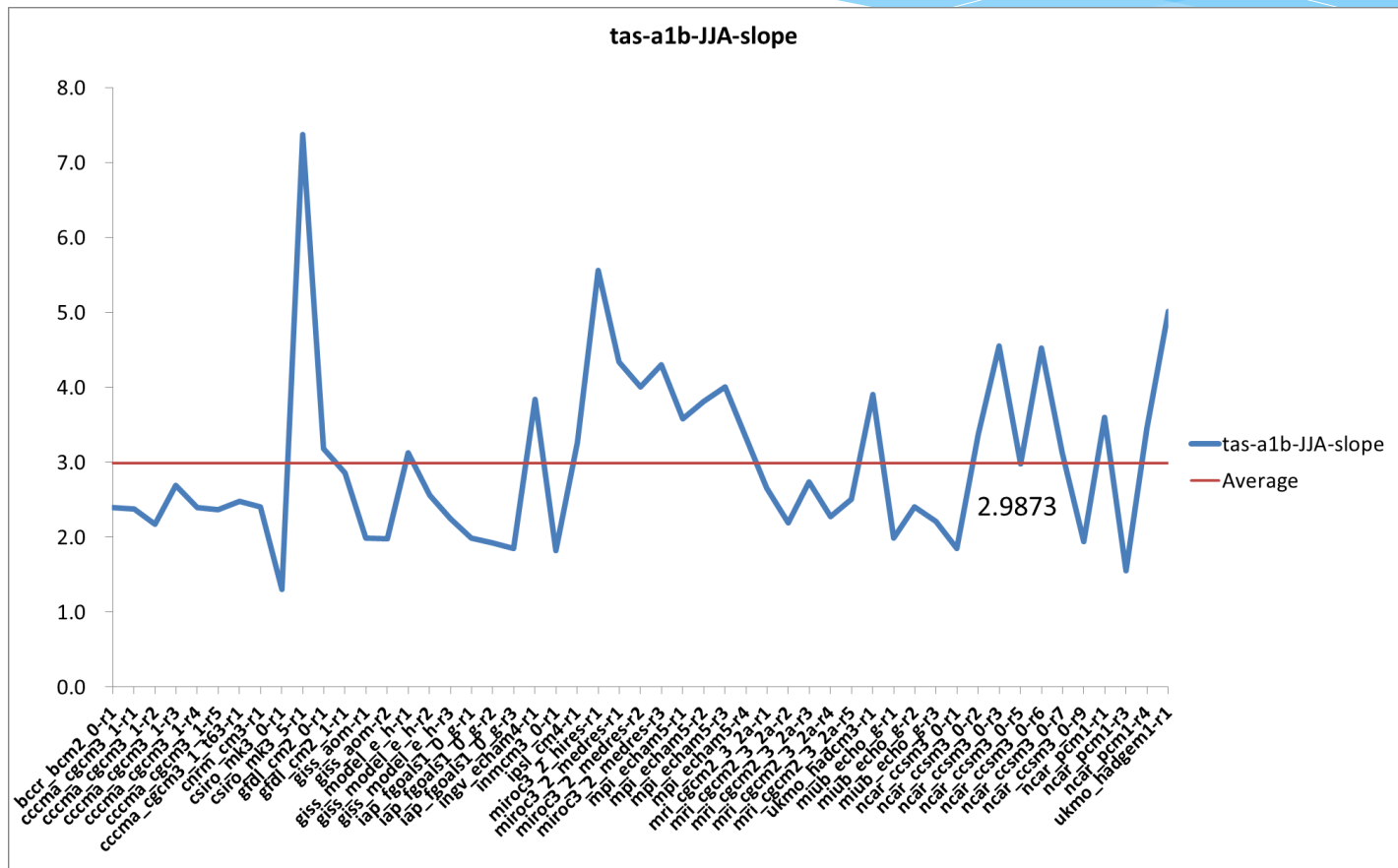


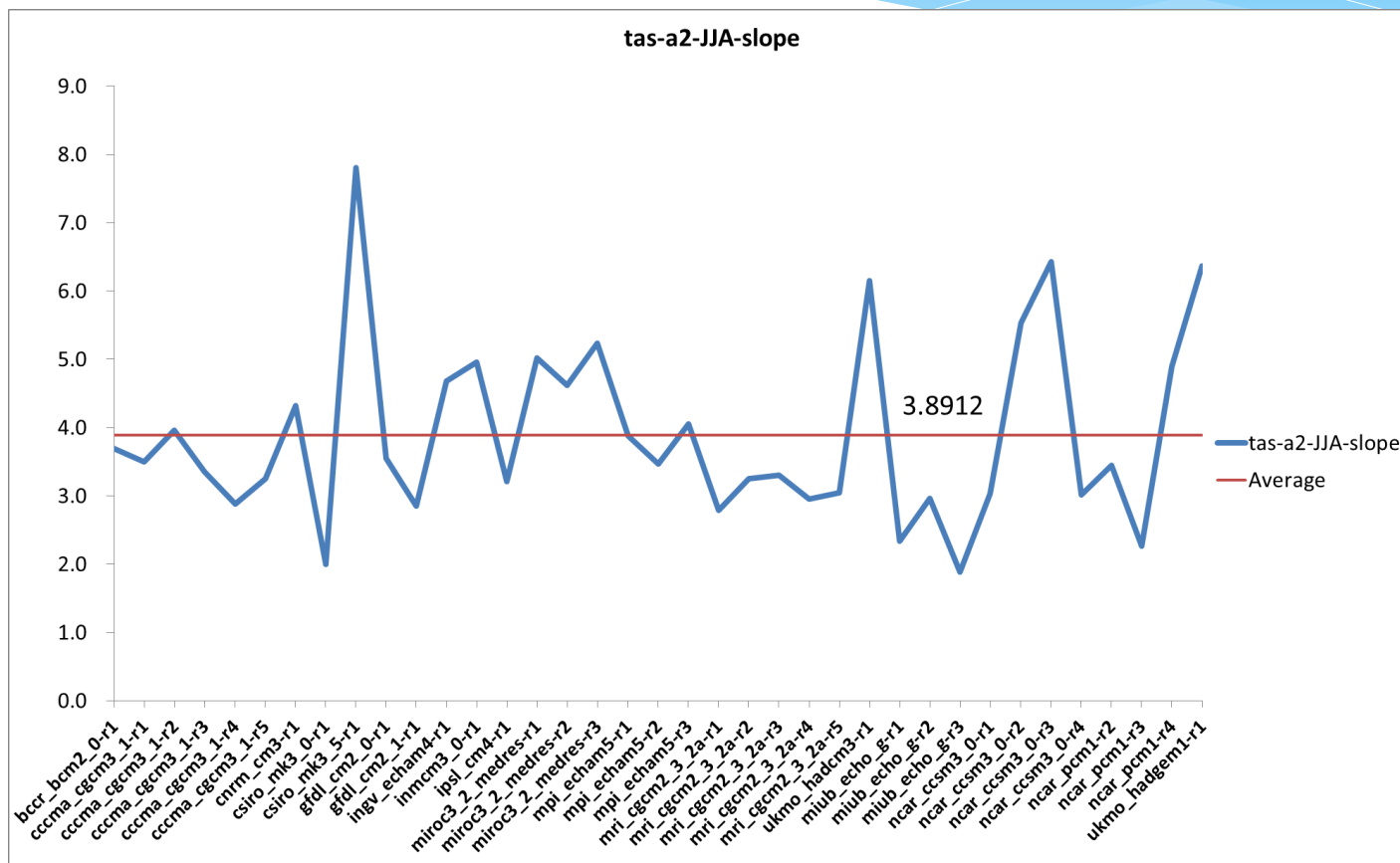




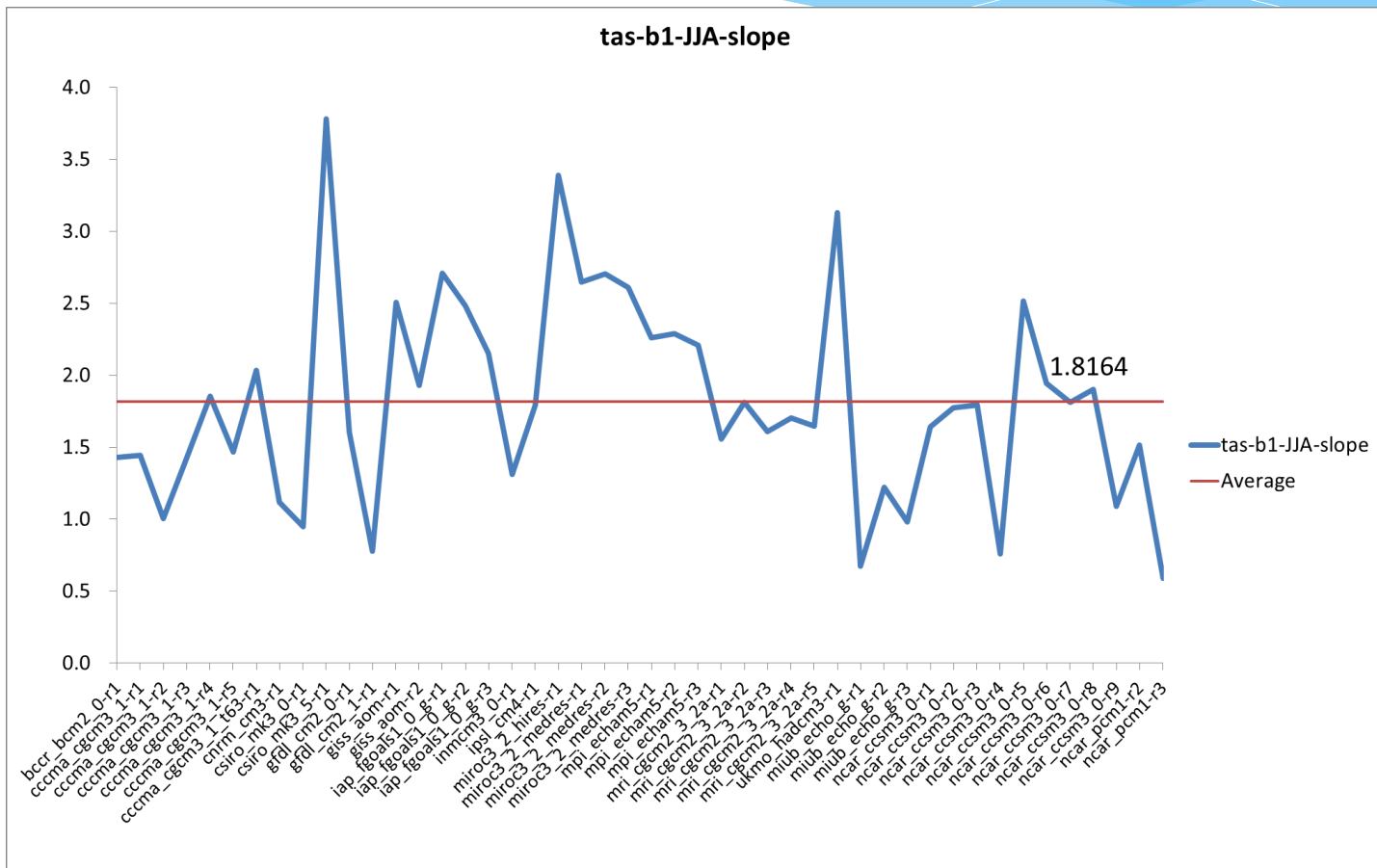


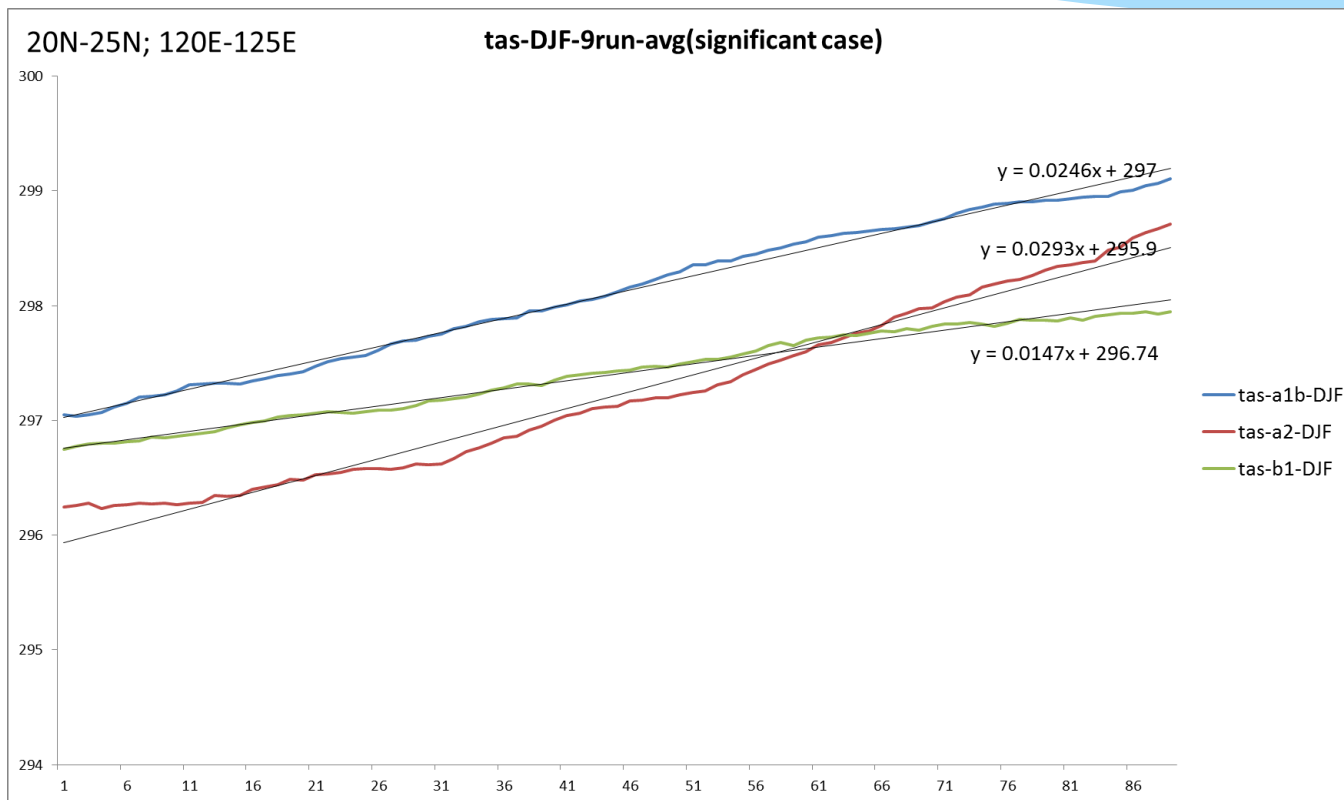


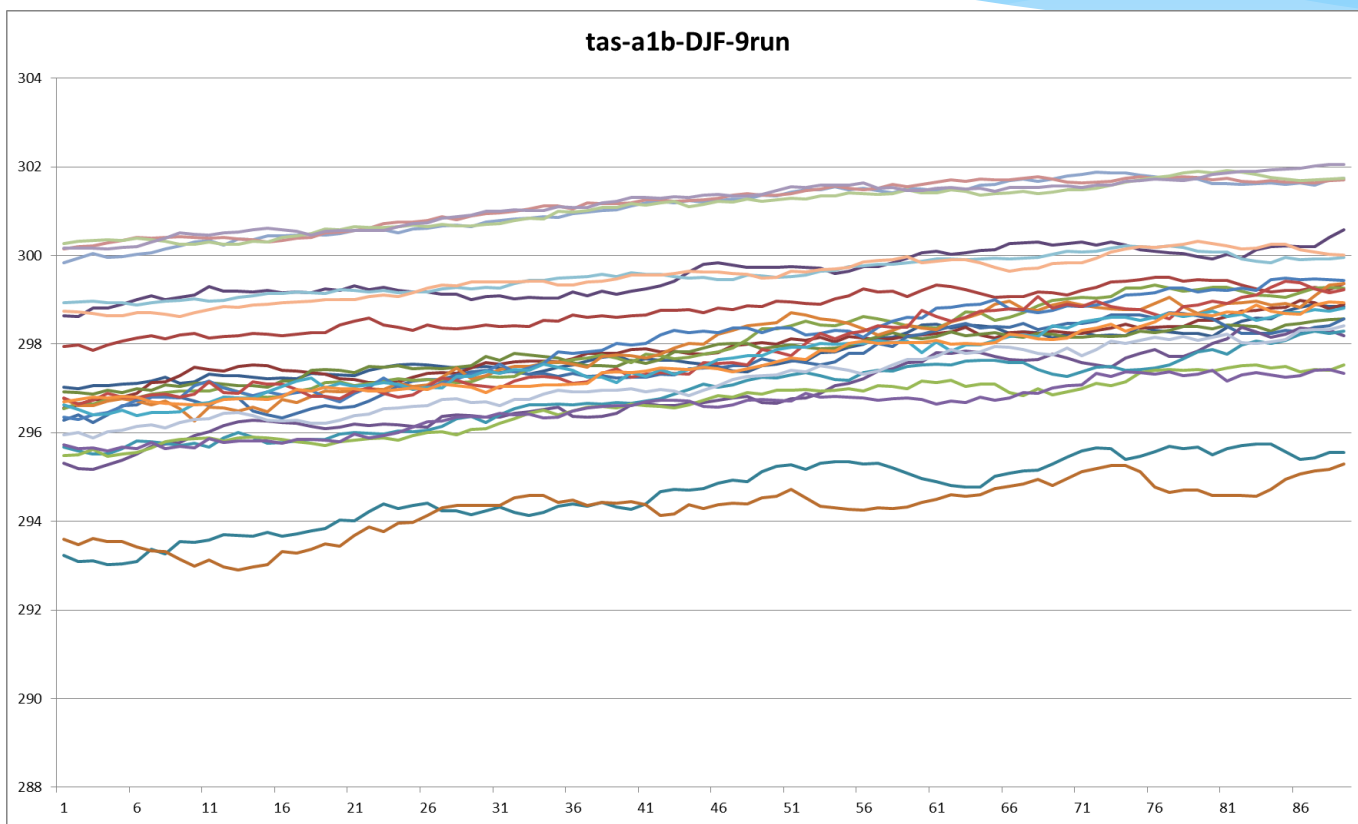




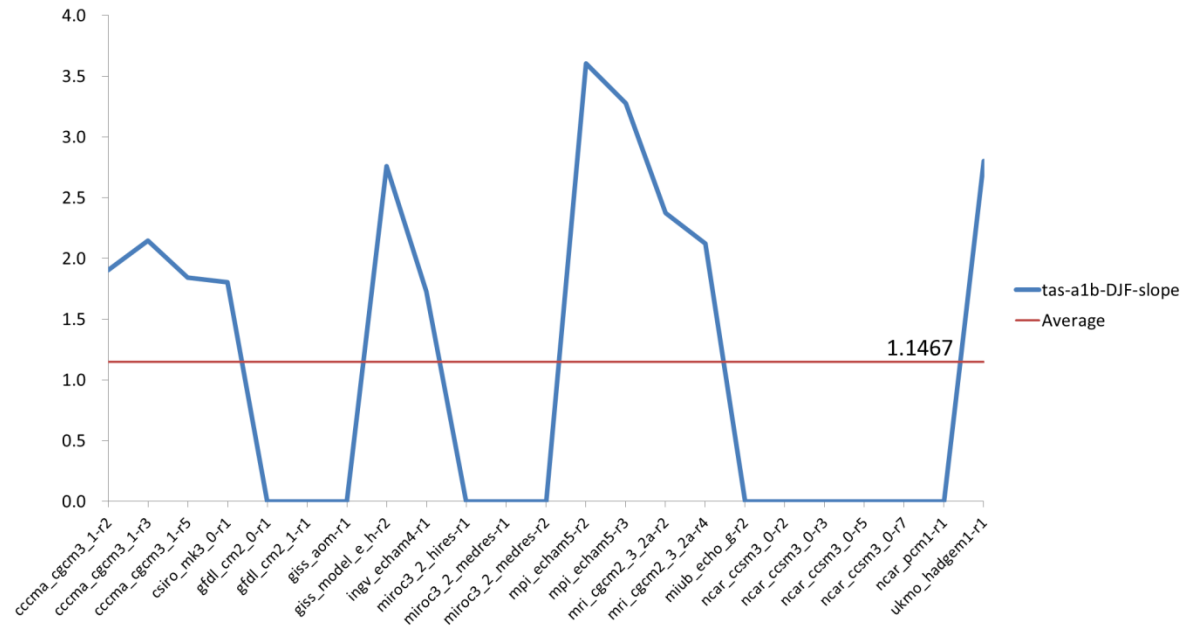




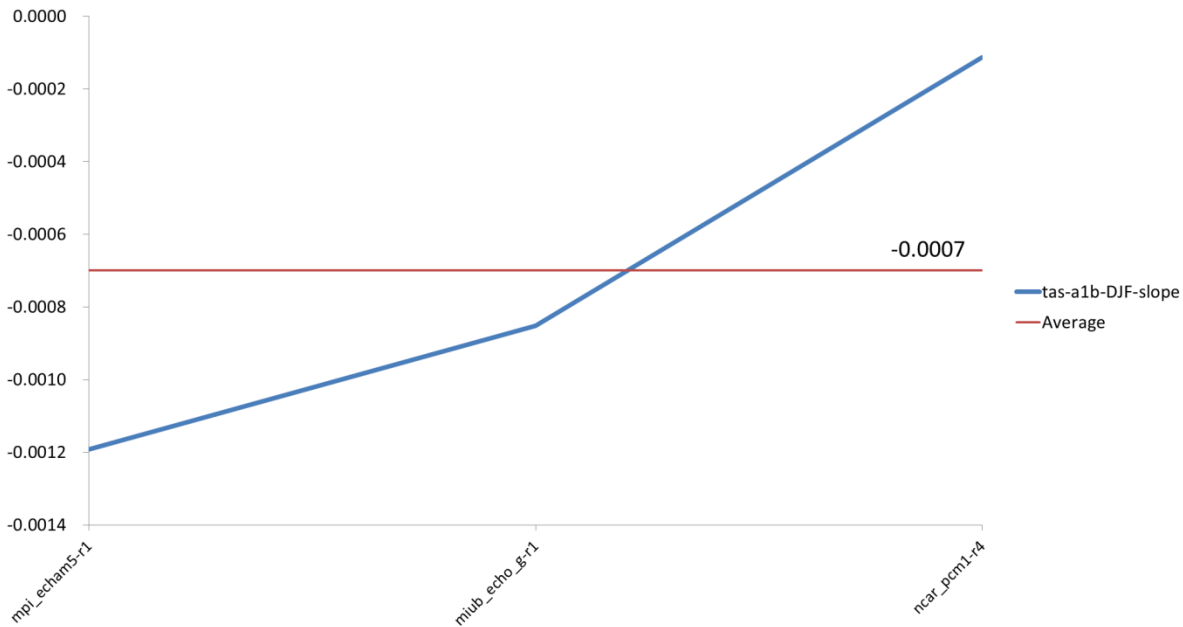


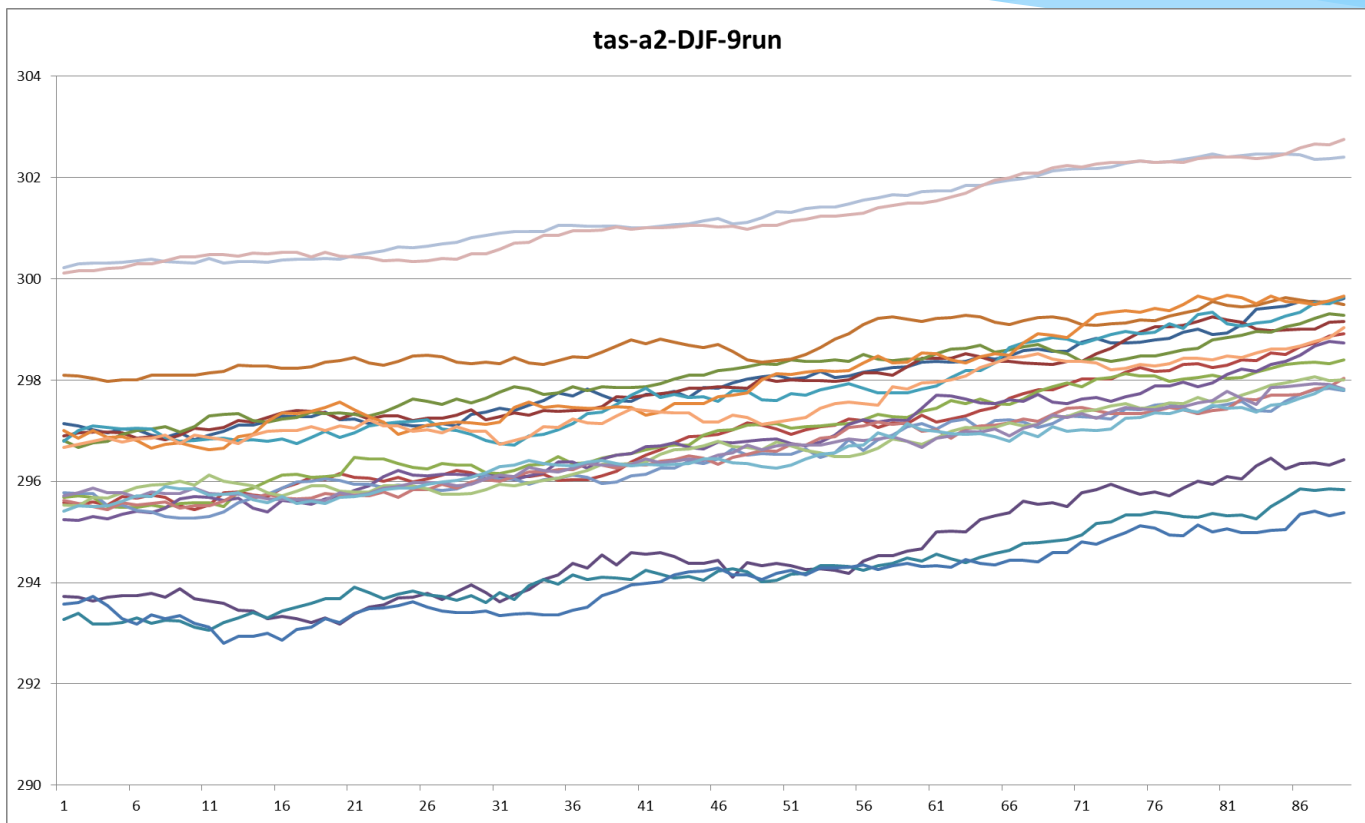


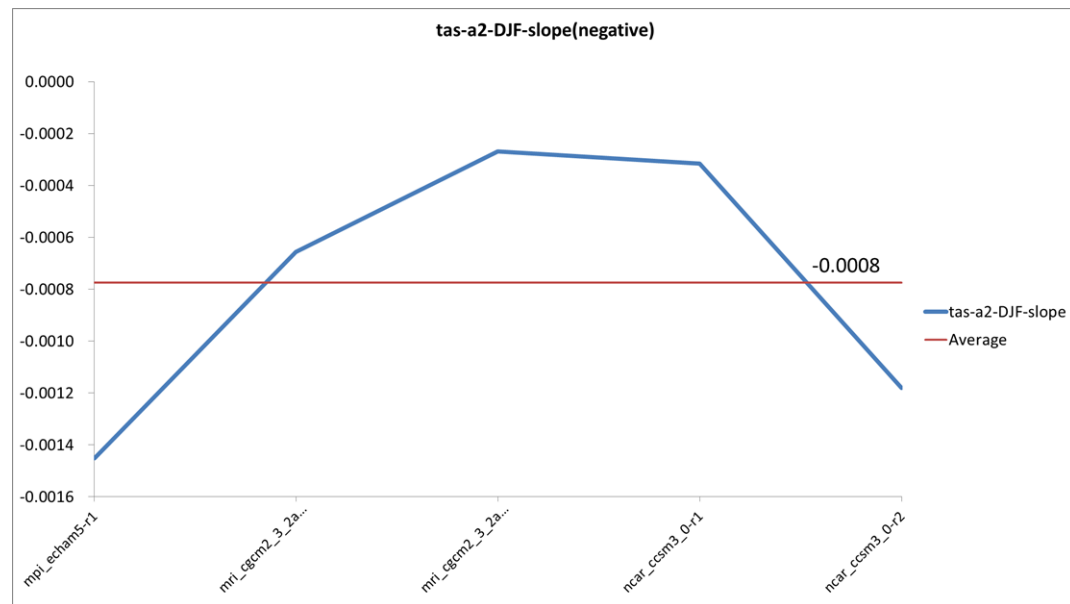
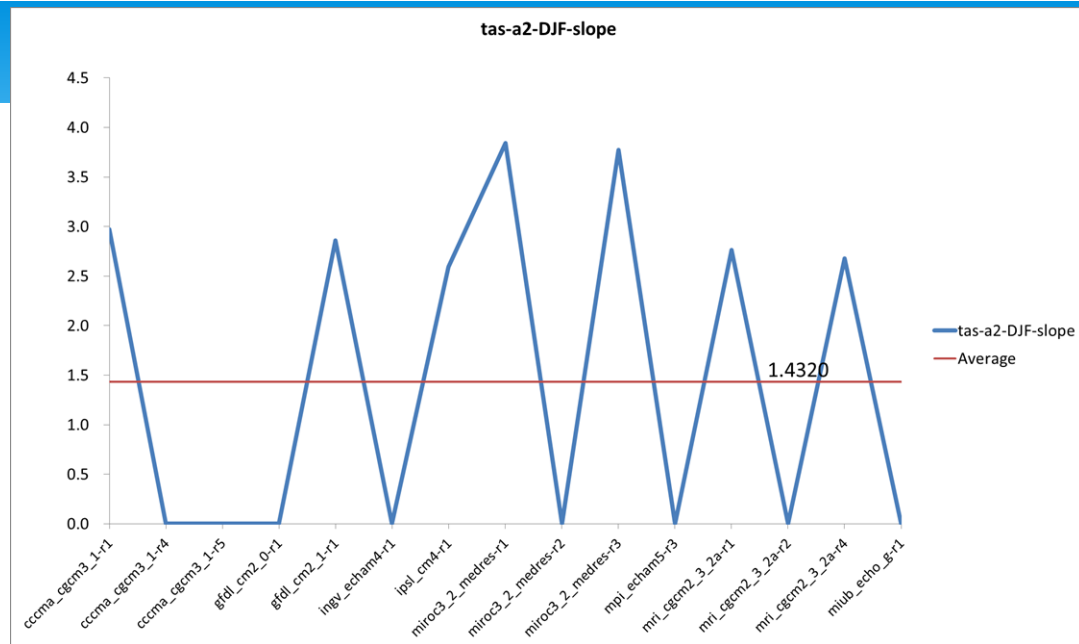
tas-a1b-DJF-slope

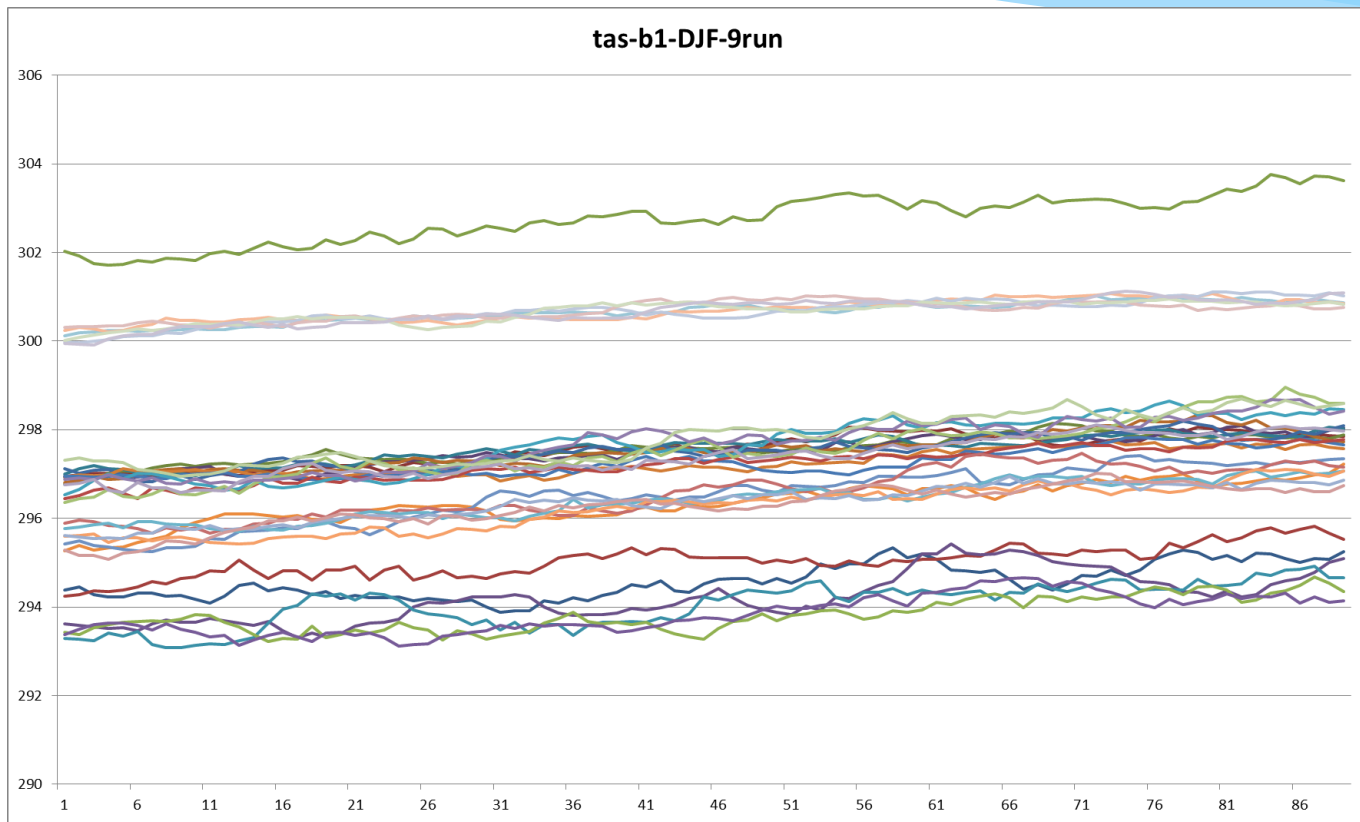


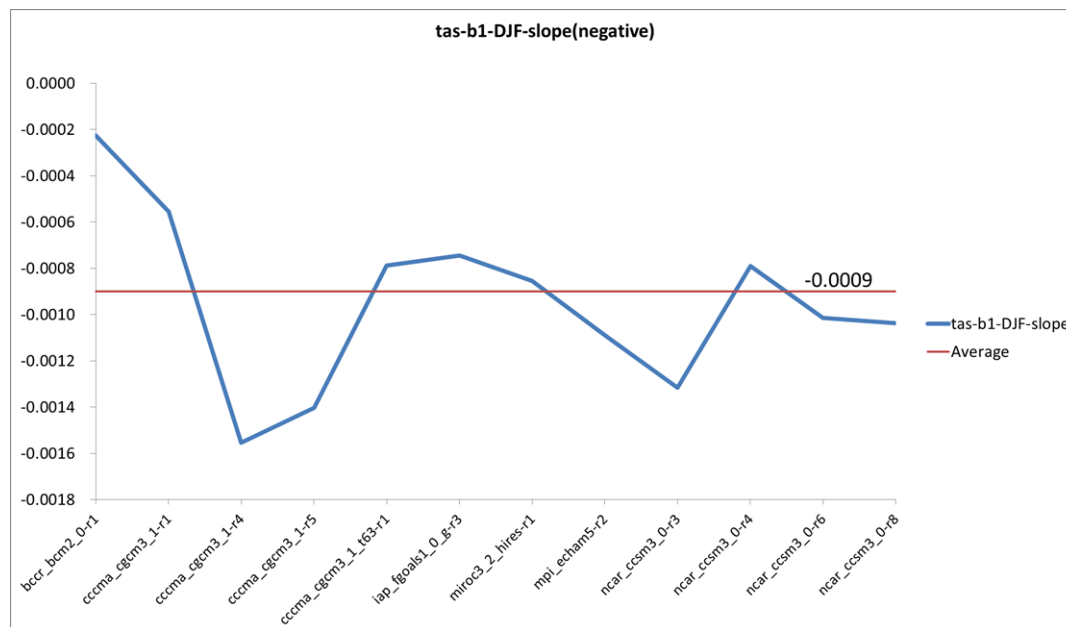
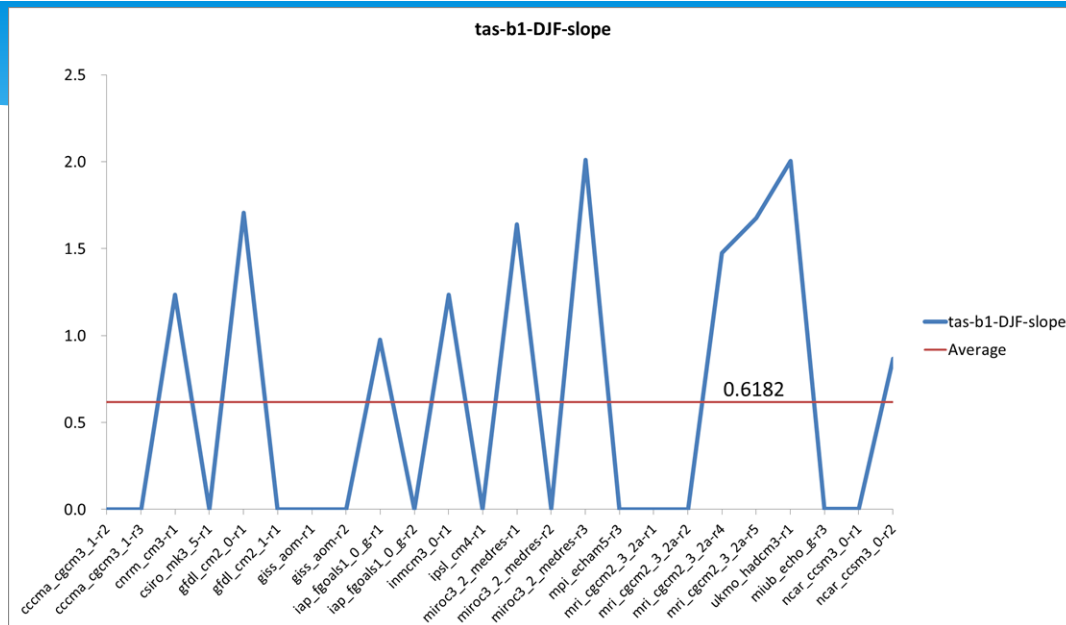
tas-a1b-DJF-slope(negative)



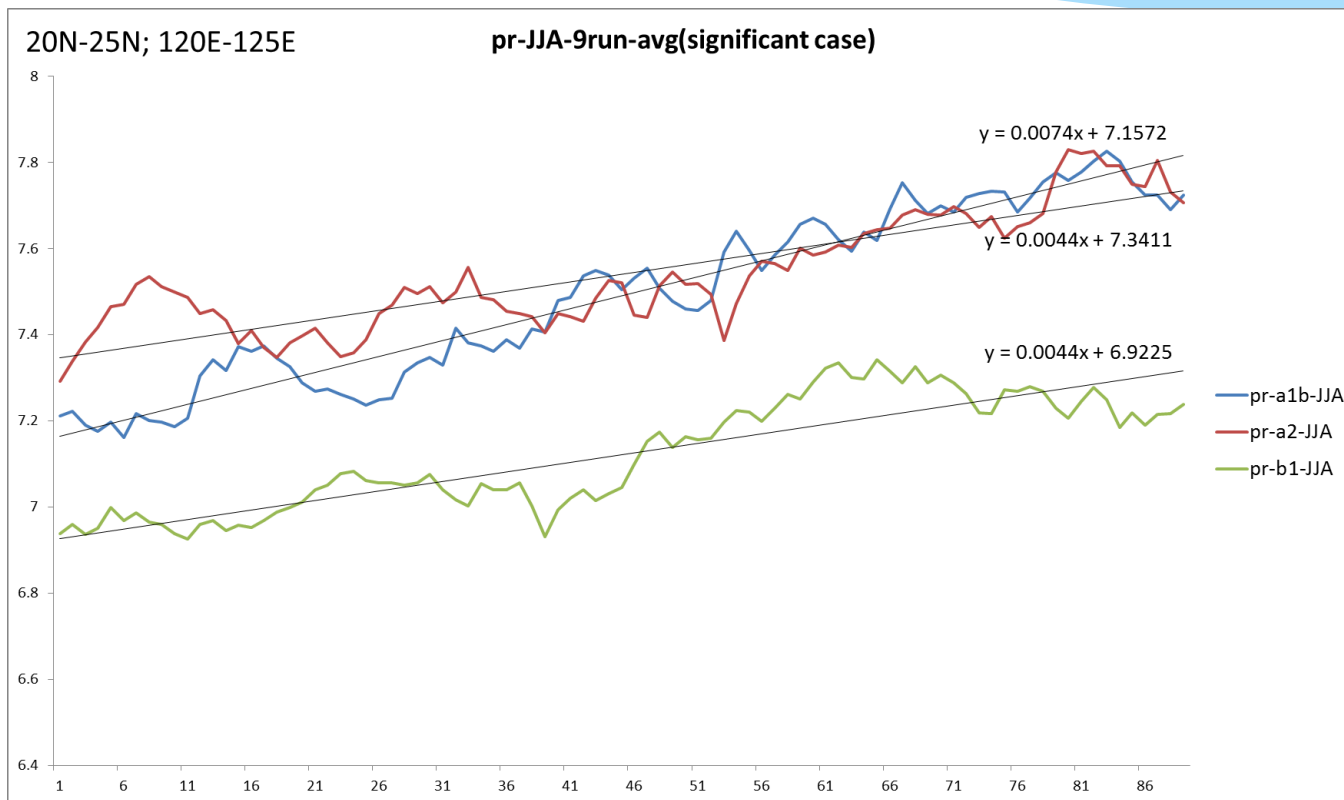


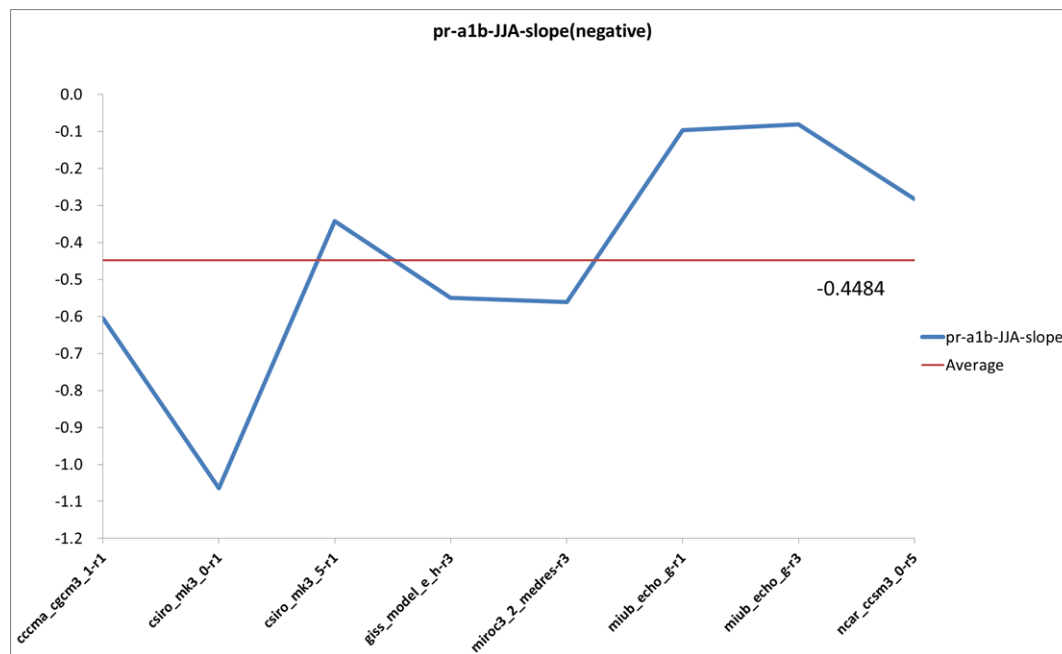
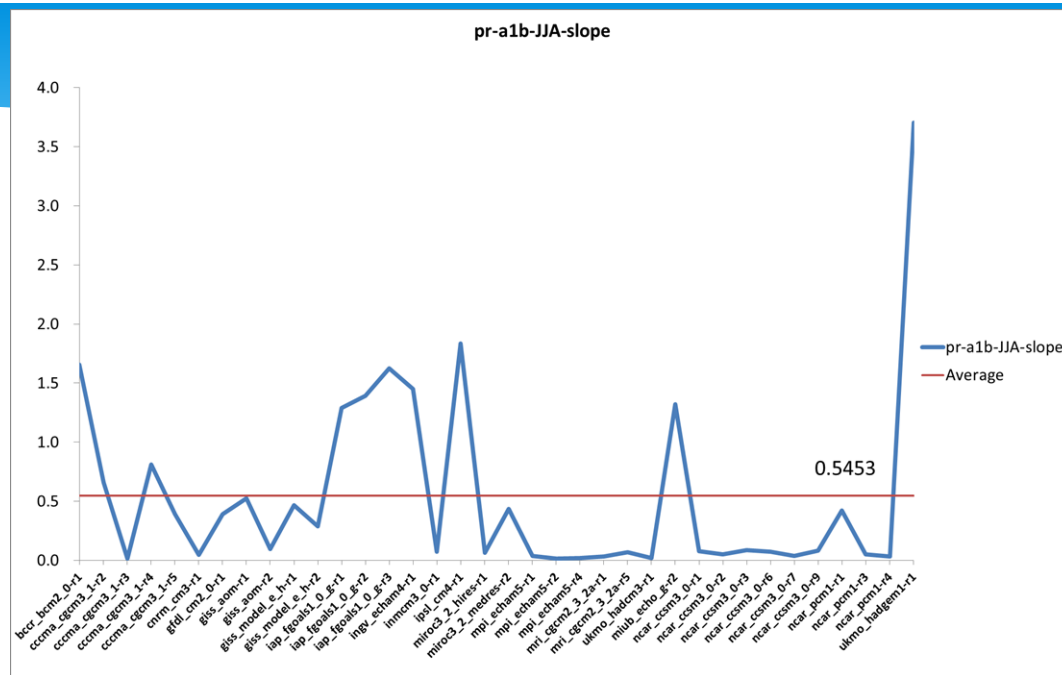


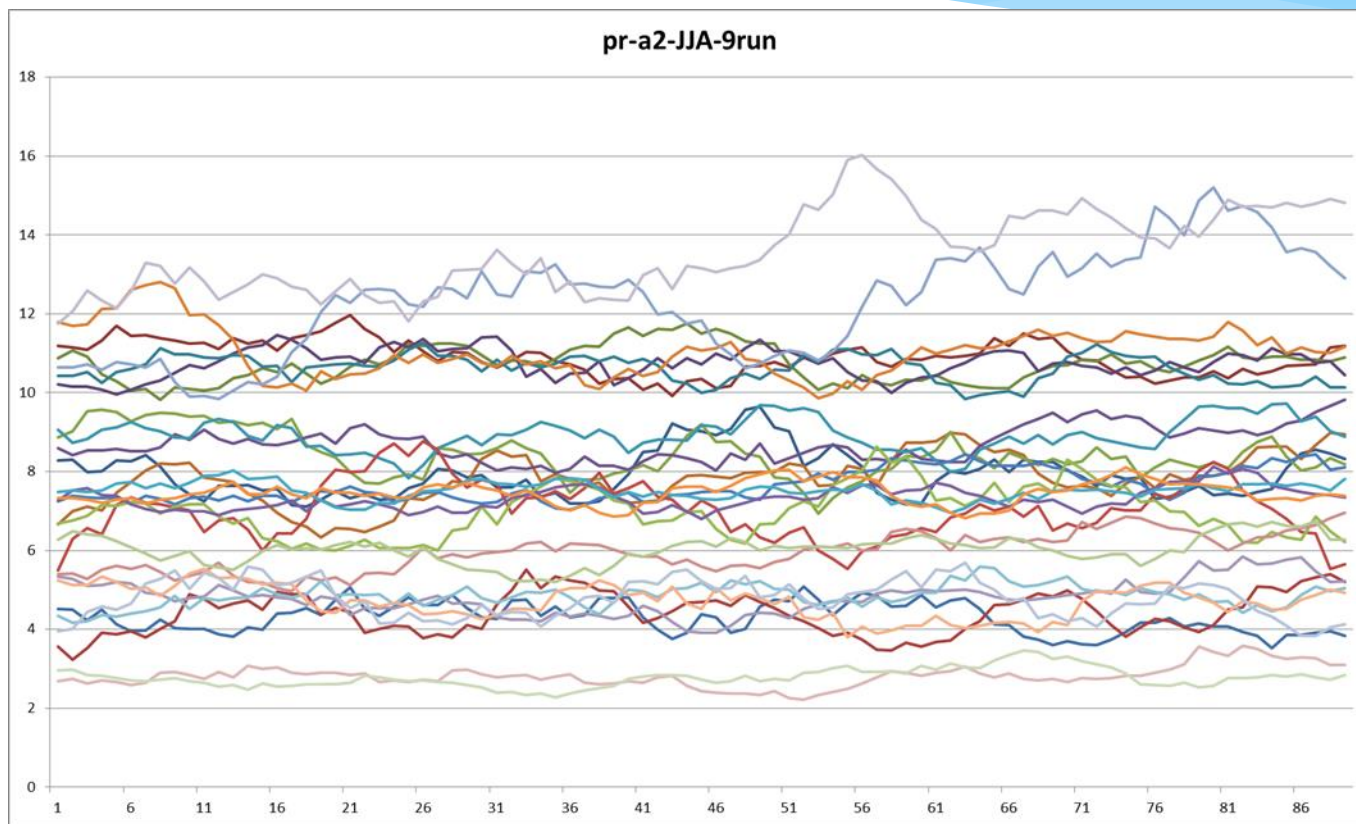


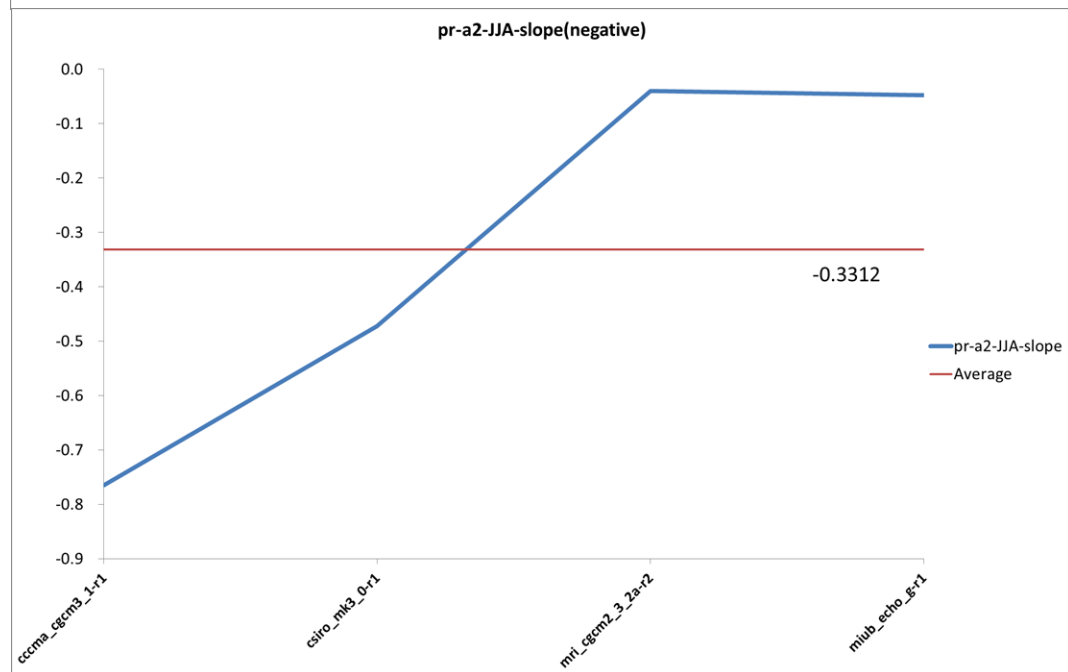
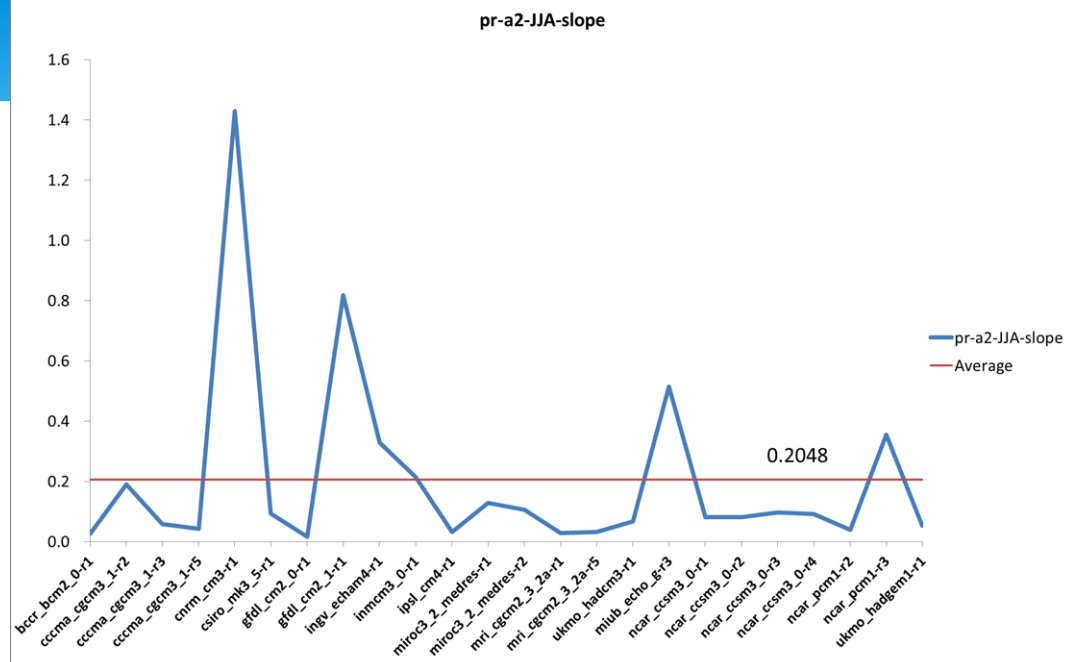


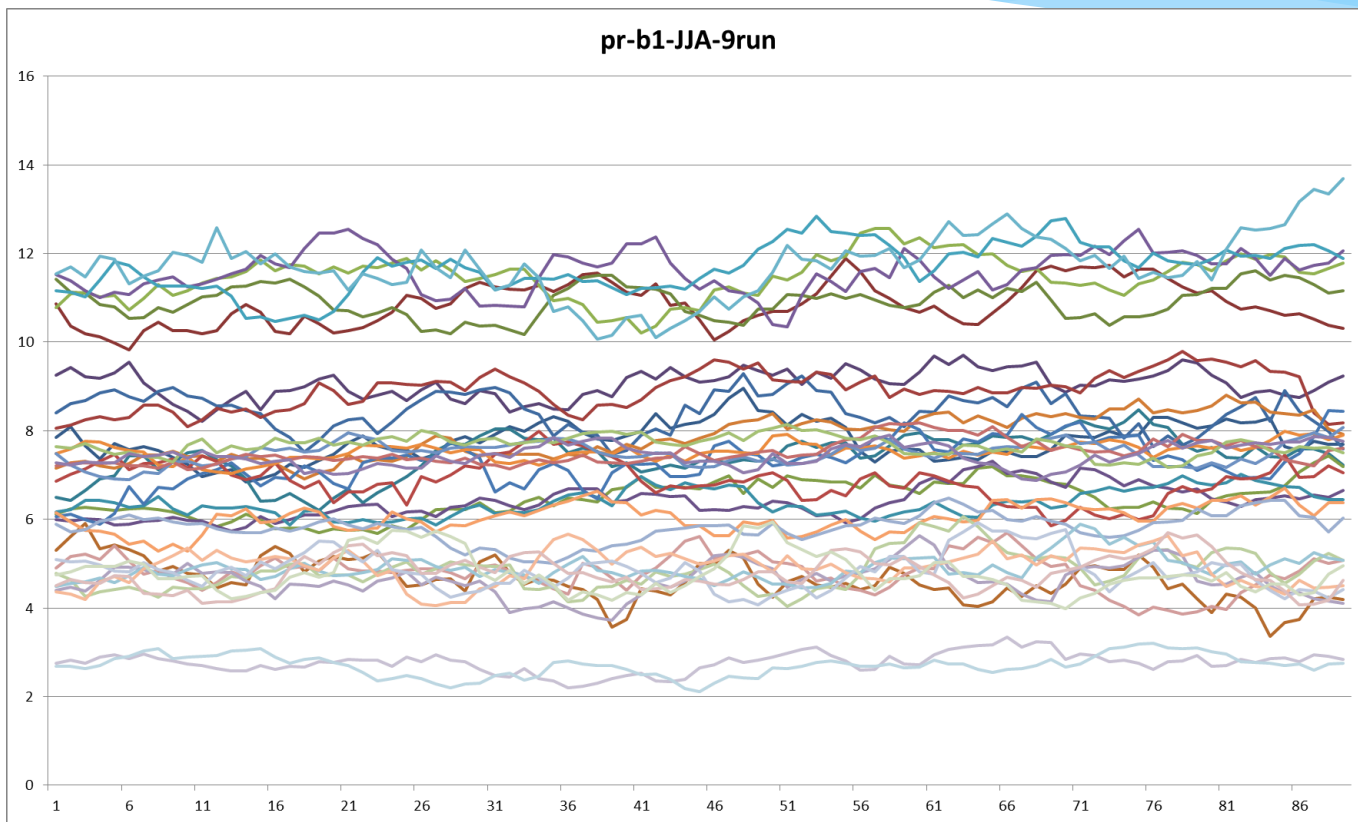


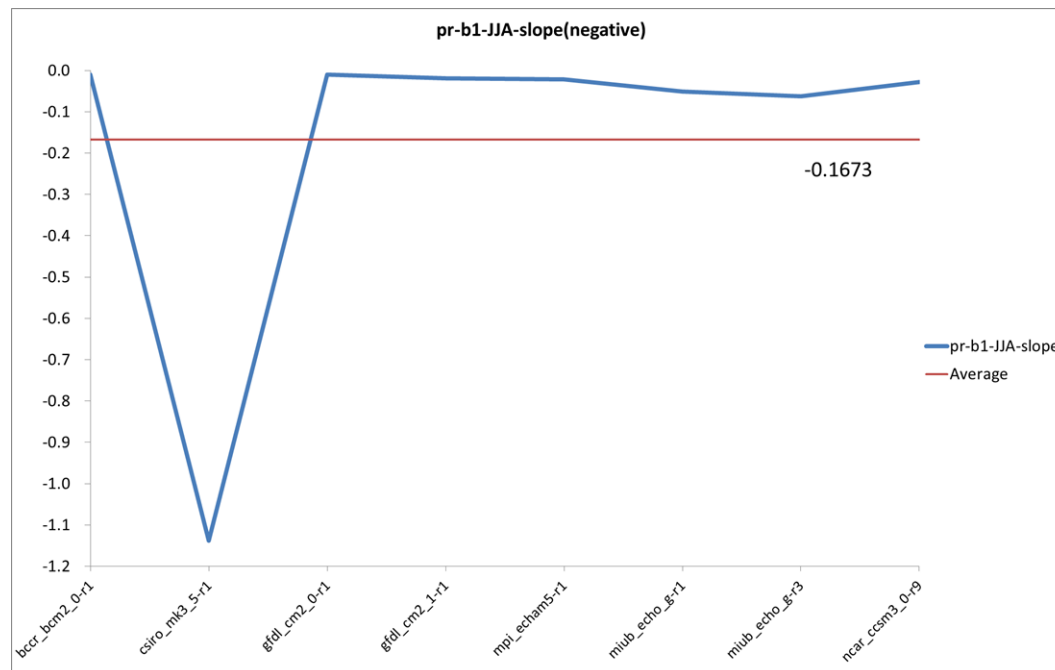
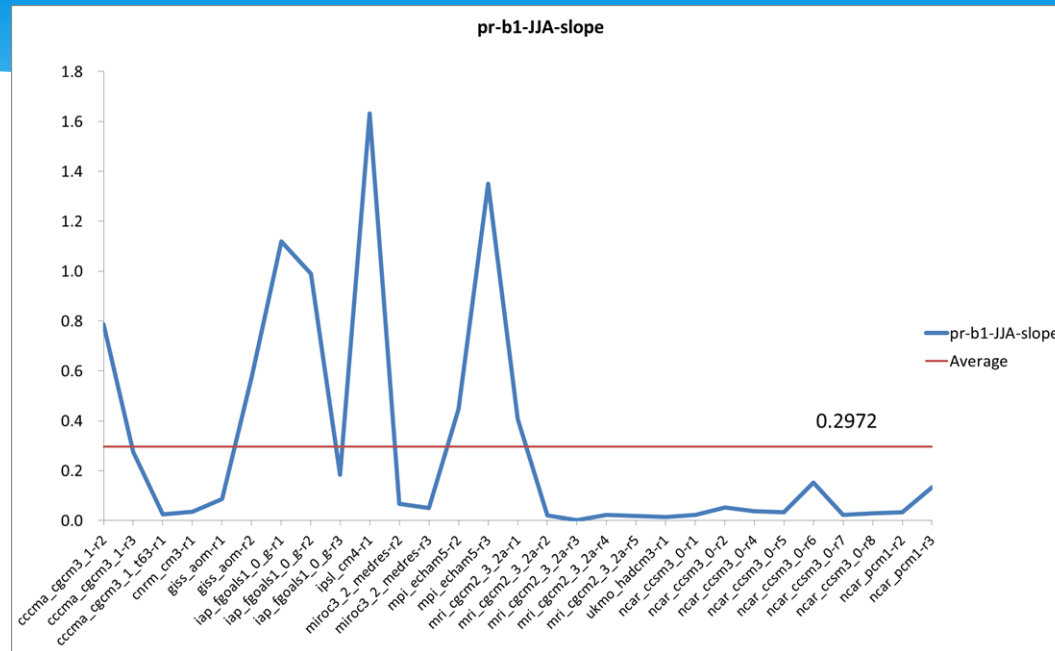


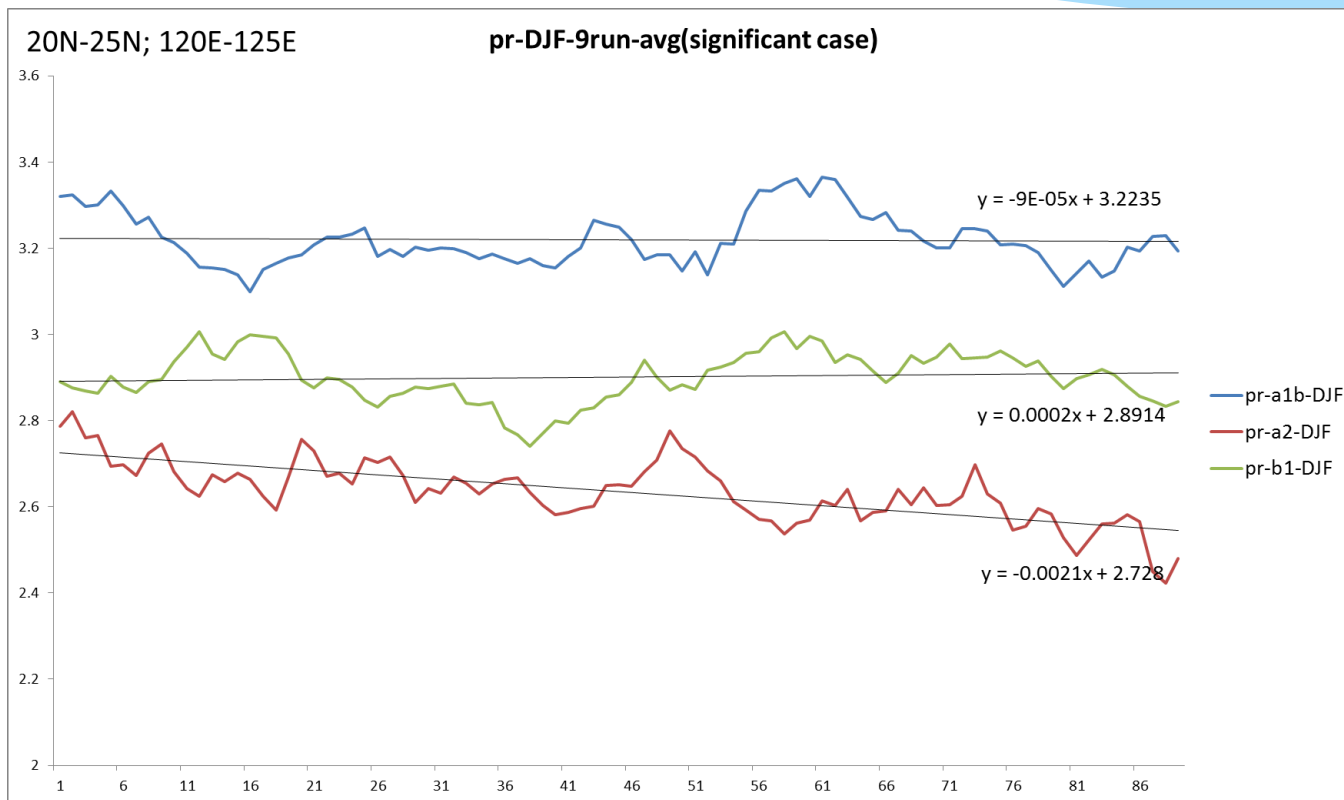


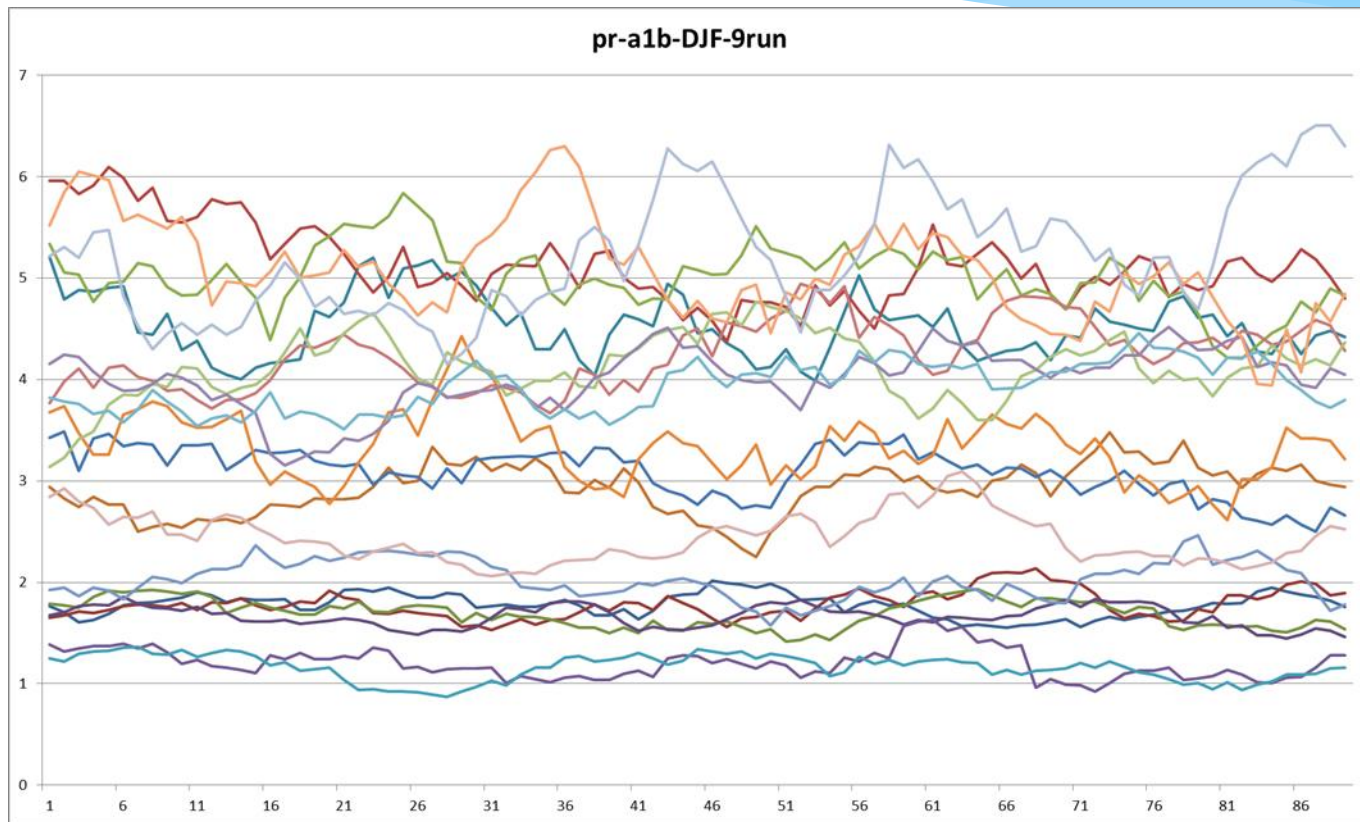




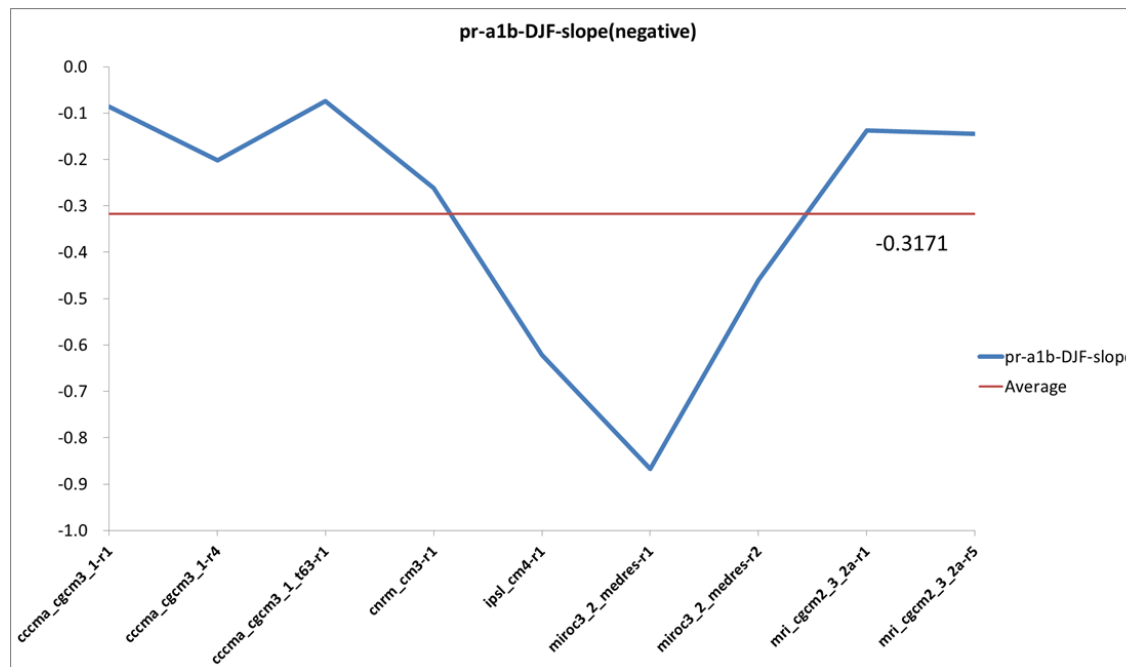
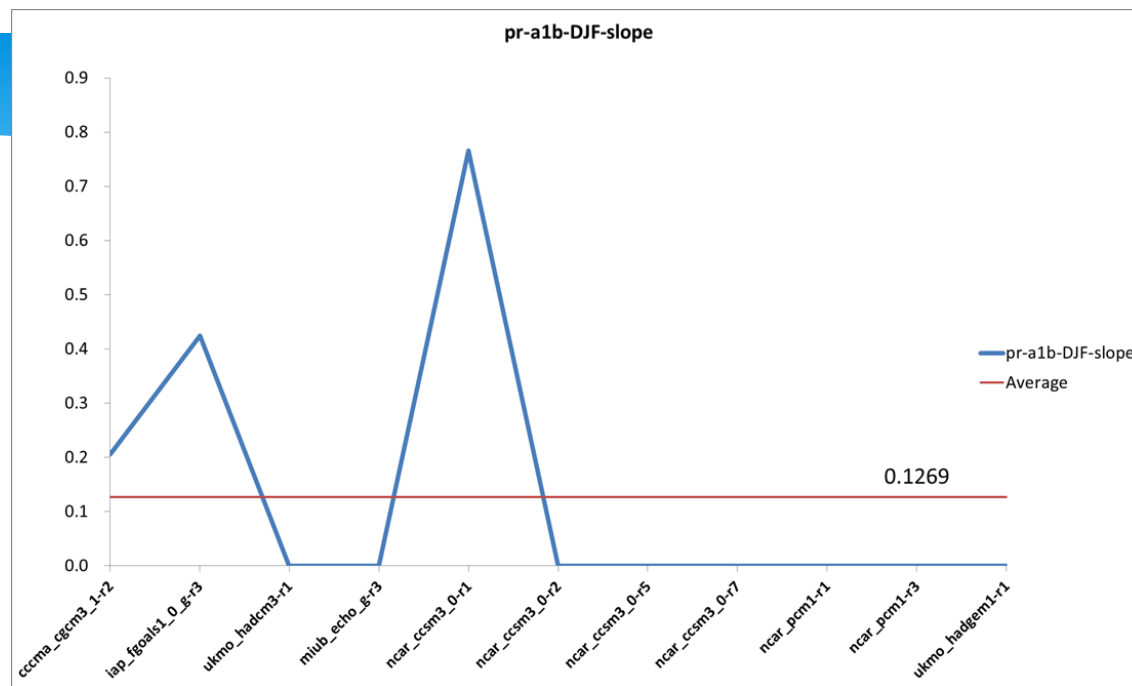




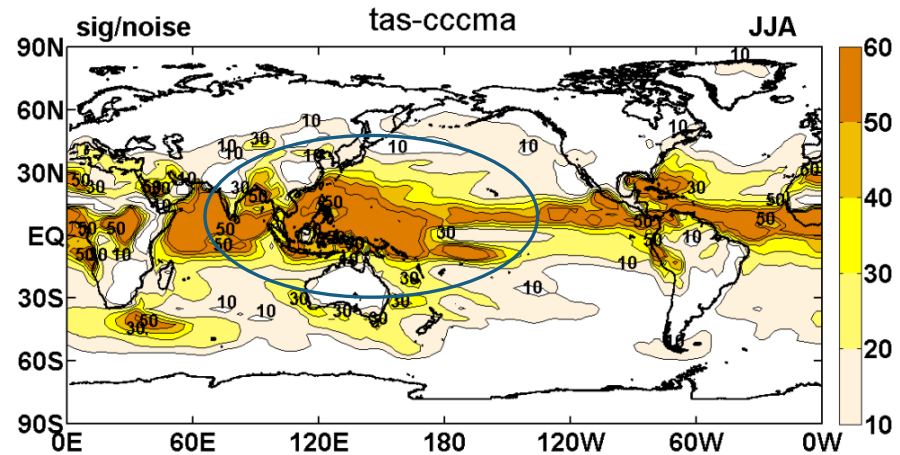
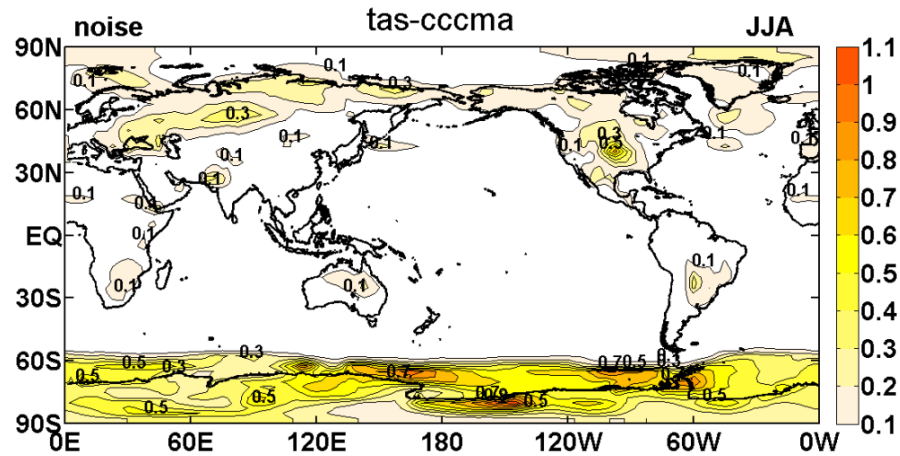
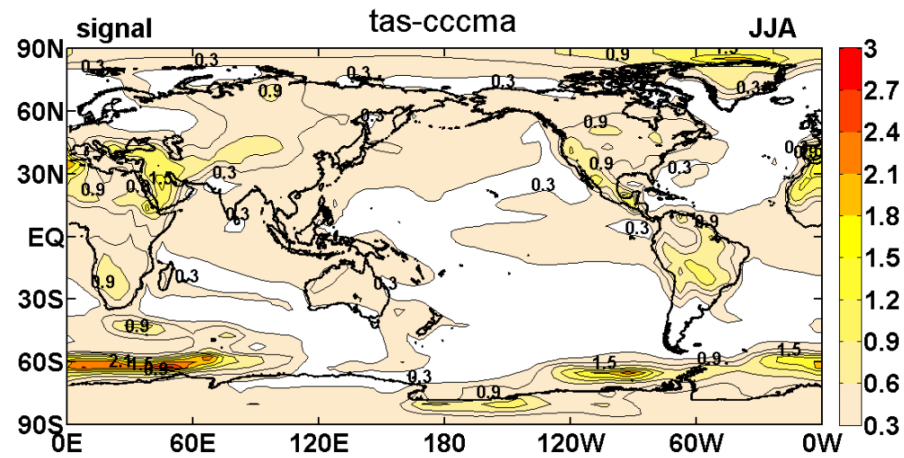


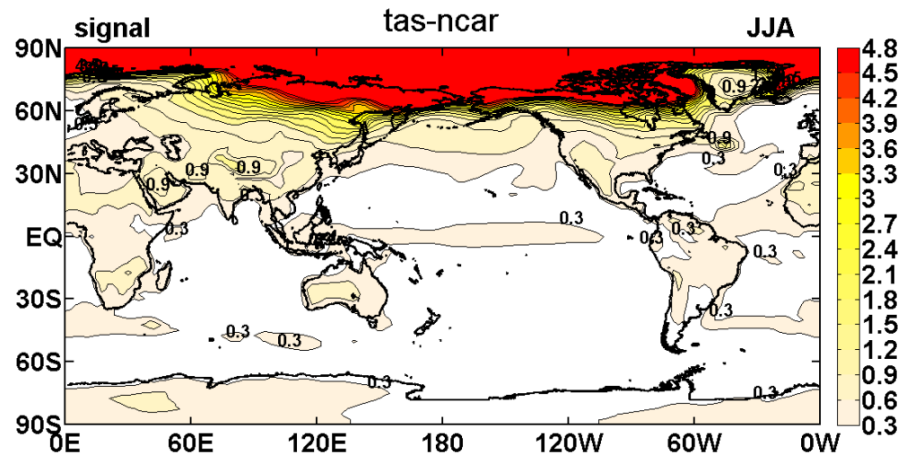




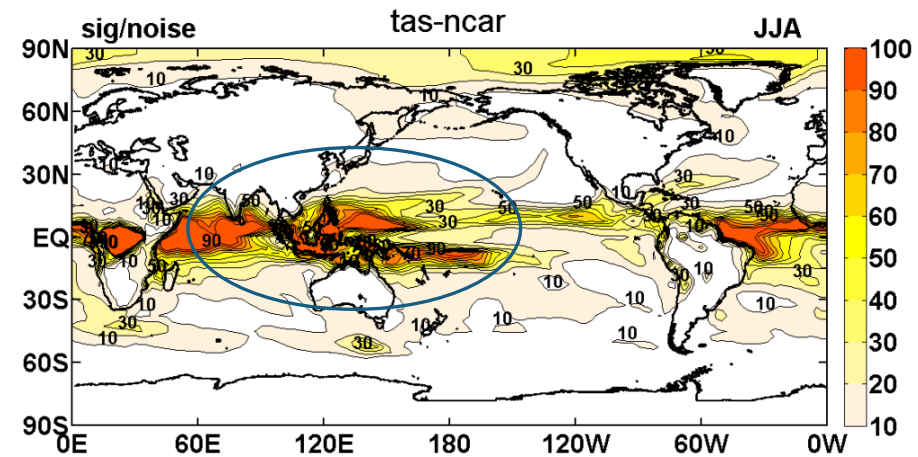
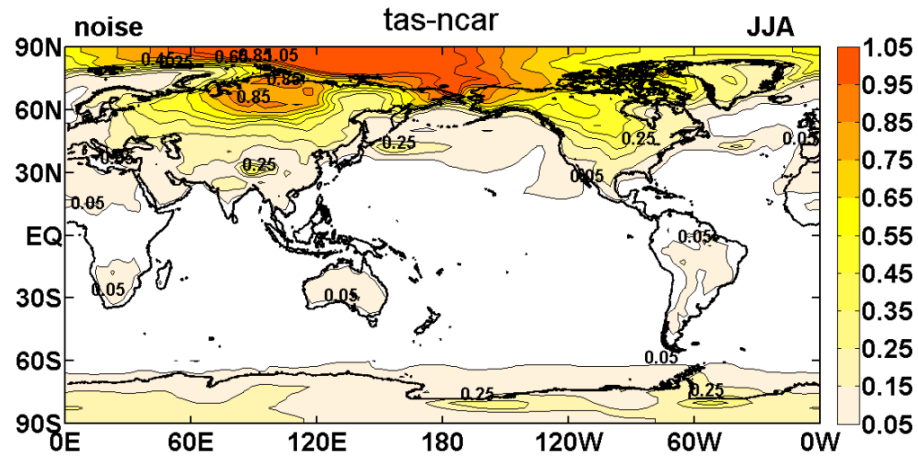


CCCMA

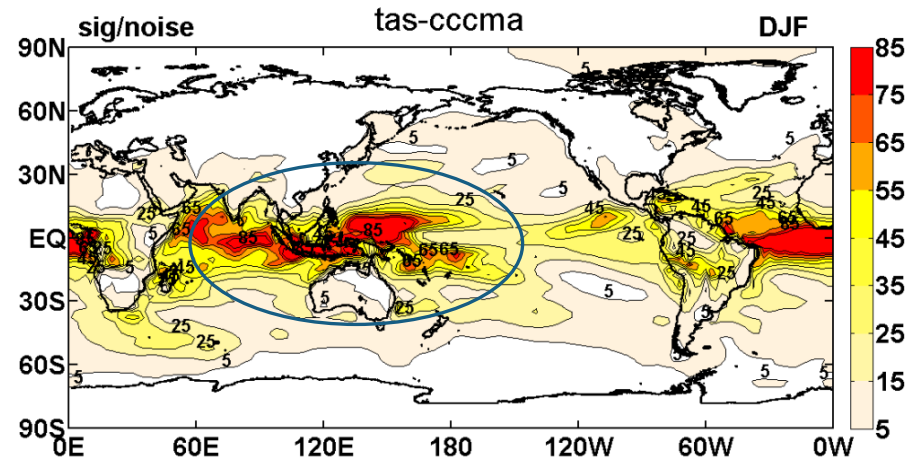
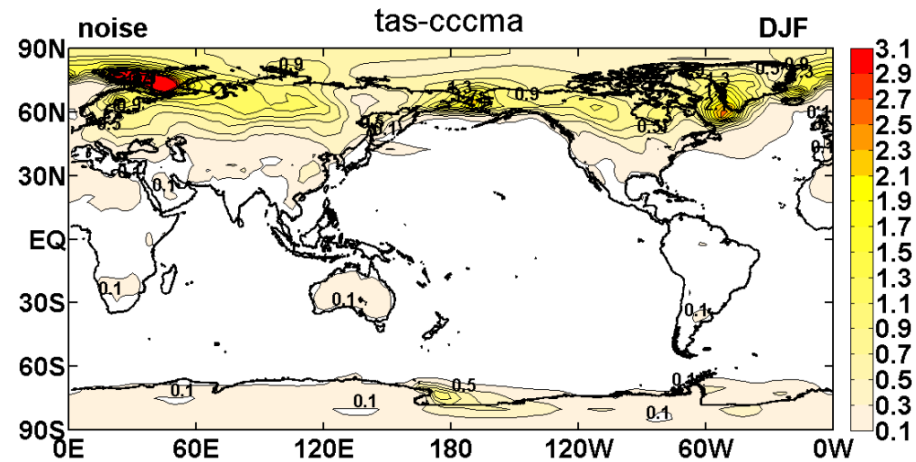
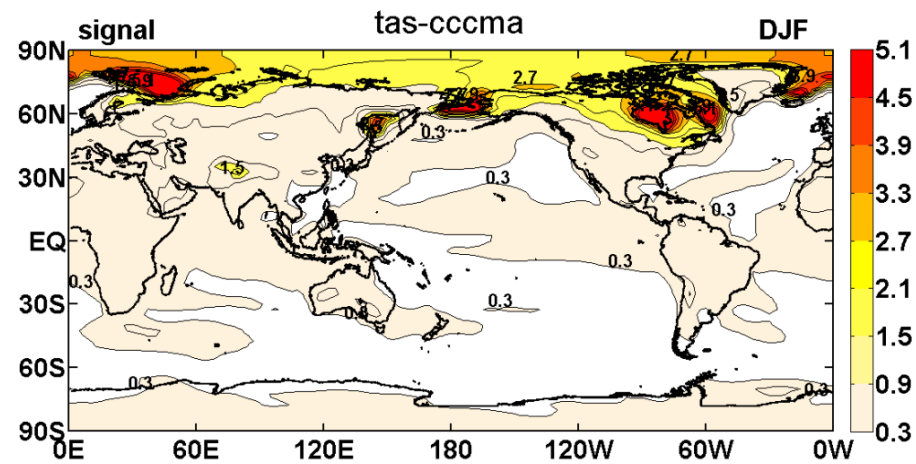




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CCCMA:





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