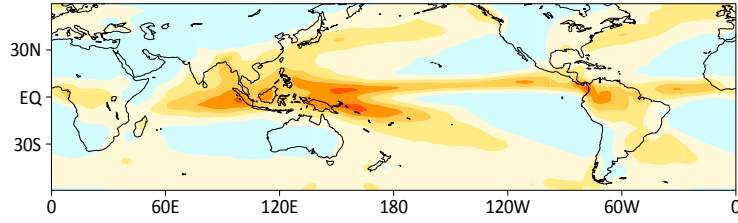


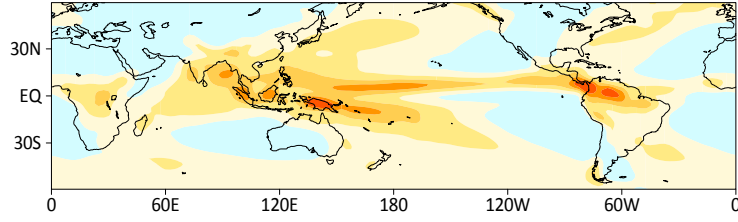
Annual Mean Precipitation (1998-2007)

a) GPM



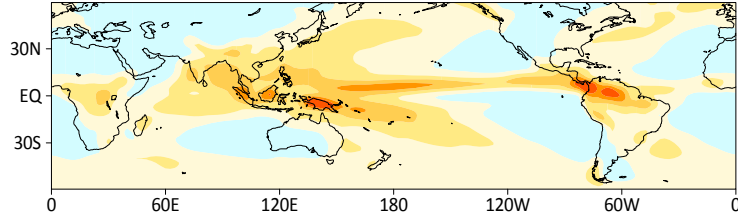
b) CAM6 control experiment

0.911



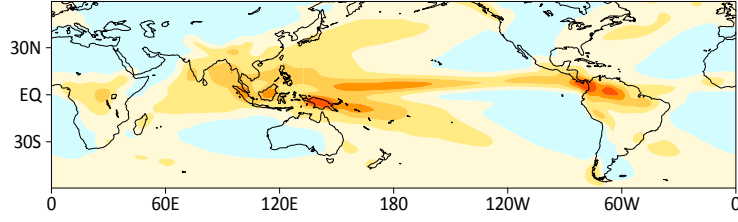
c) 25nup\_1a05b3alph

0.910



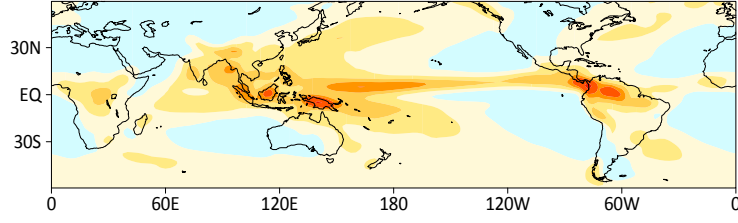
d) 25nup\_1a05b3alph\_dorad

0.912



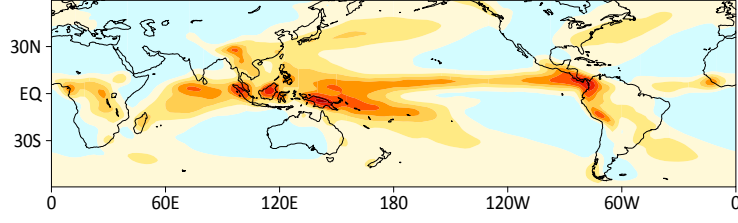
e) 25nup\_1a05b3alph\_halfdiss

0.897



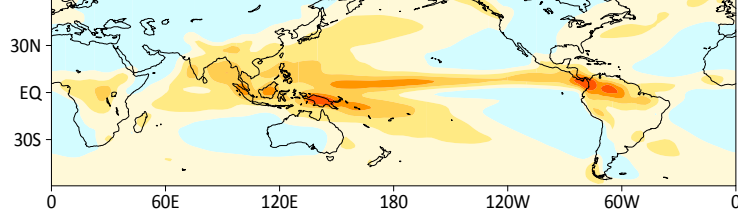
f) 25nup\_1a05b3alph\_nozm

0.866



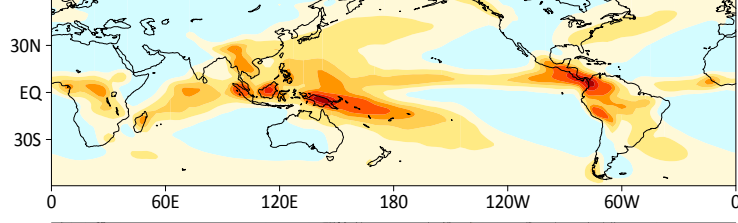
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.907



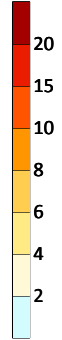
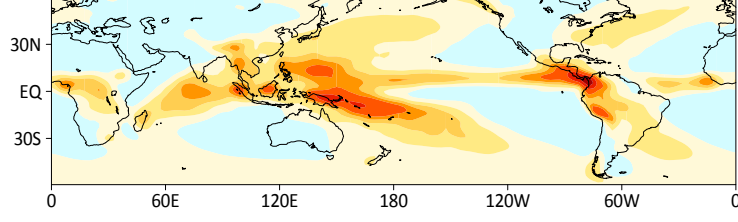
h) 25nup\_2a05b0alph\_nozm

0.846



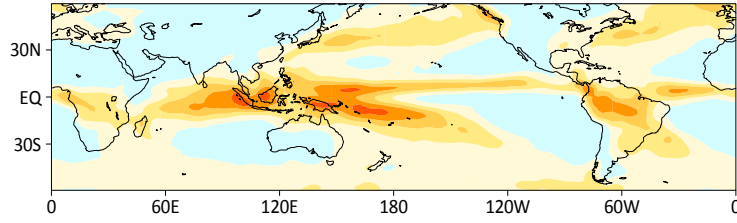
i) 25nup\_2a05b0alph\_as-1alim\_nozm

0.868



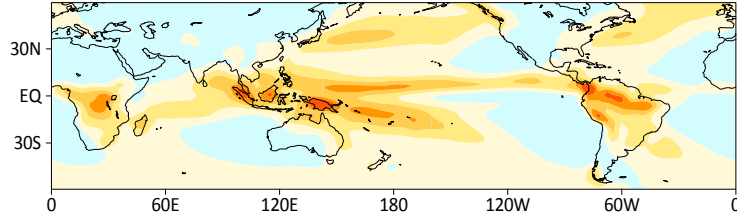
Winter (Nov-Apr) Mean Precipitation (1998-2007)

a) GPM



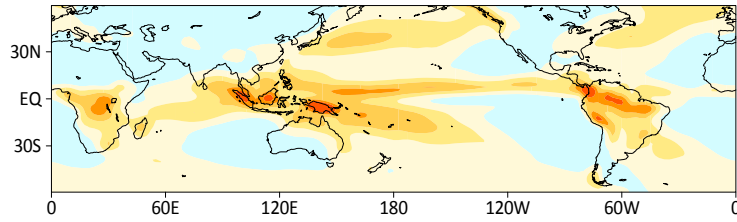
b) CAM6 control experiment

0.907



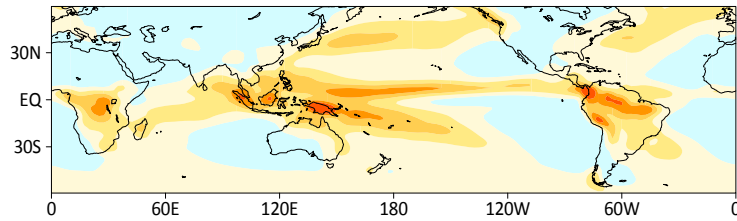
c) 25nup\_1a05b3alph

0.908



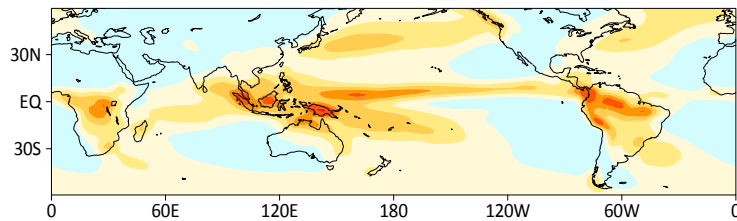
d) 25nup\_1a05b3alph\_dorad

0.906



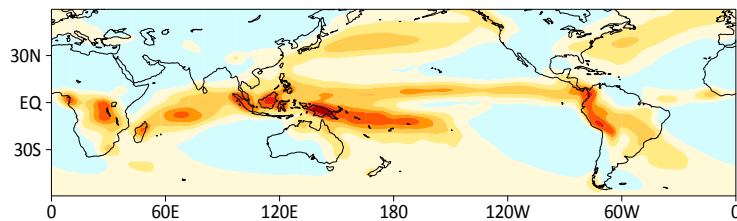
e) 25nup\_1a05b3alph\_halfdiss

0.888



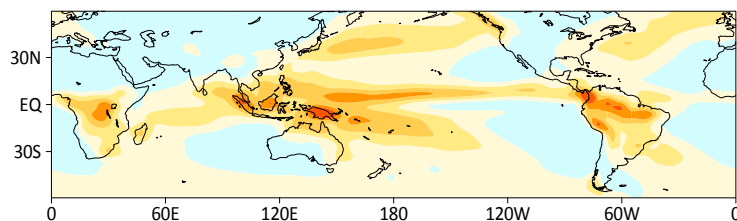
f) 25nup\_1a05b3alph\_nozm

0.857



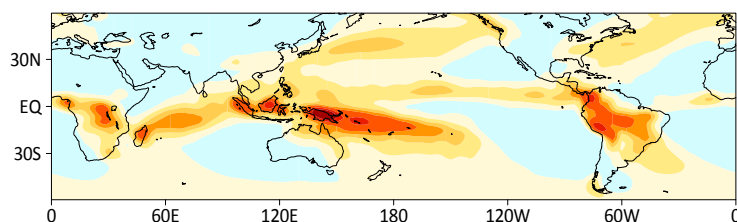
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.903



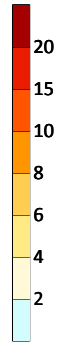
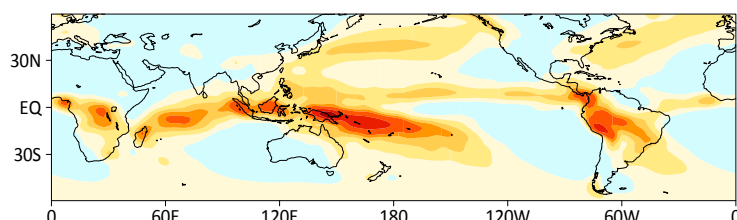
h) 25nup\_2a05b0alph\_nozm

0.837



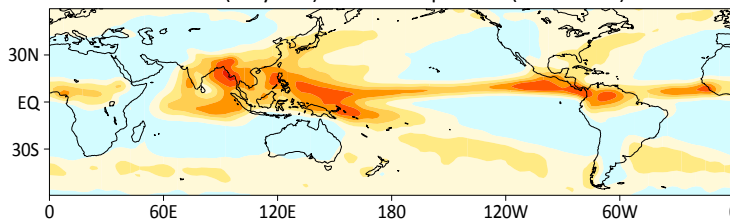
i) 25nup\_2a05b0alph\_as-1alim\_nozm

0.866



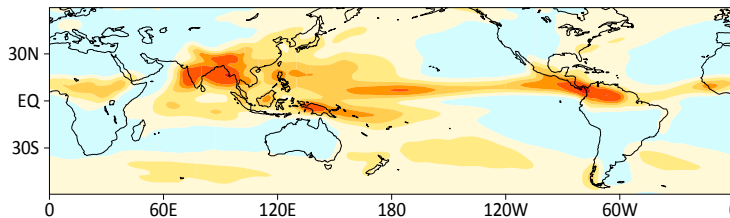
Summer (May-Oct) Mean Precipitation (1998-2007)

a) GPM



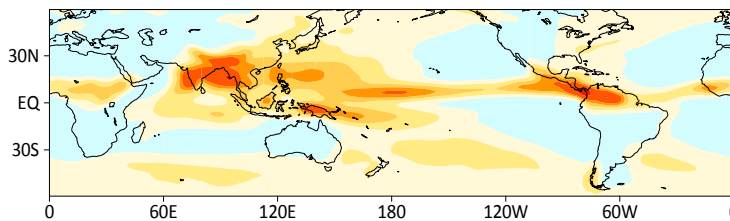
b) CAM6 control experiment

0.894



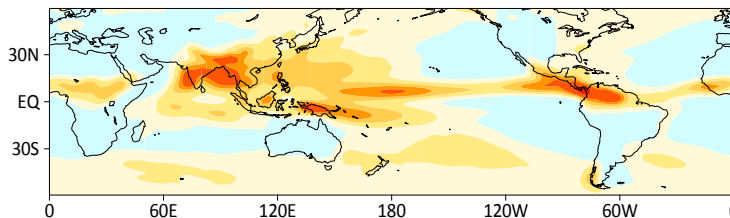
c) 25nup\_1a05b3alph

0.893



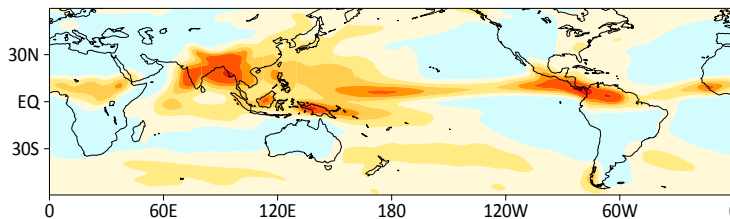
d) 25nup\_1a05b3alph\_dorad

0.895



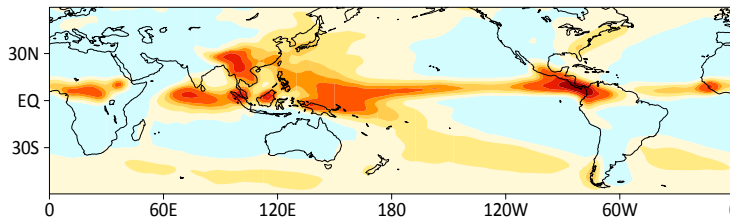
e) 25nup\_1a05b3alph\_halfdiss

0.887



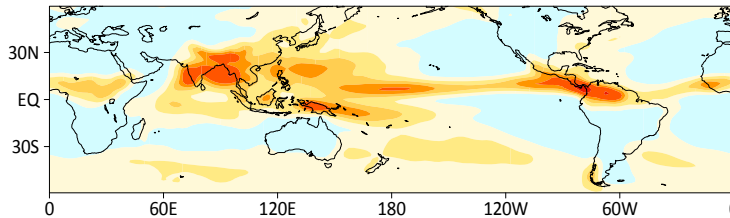
f) 25nup\_1a05b3alph\_nozm

0.841



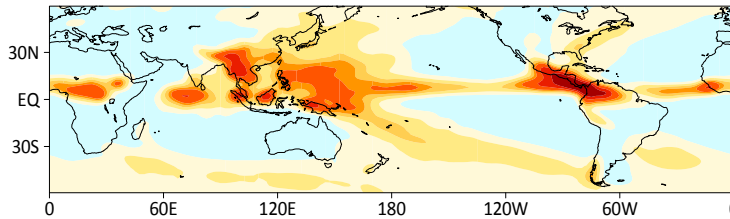
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.892



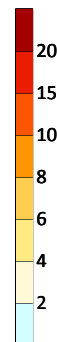
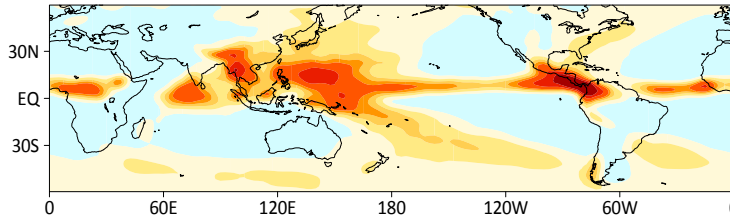
h) 25nup\_2a05b0alph\_nozm

0.831



i) 25nup\_2a05b0alph\_as-1alim\_nozm

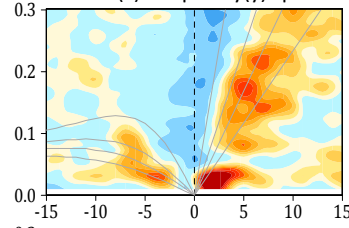
0.840



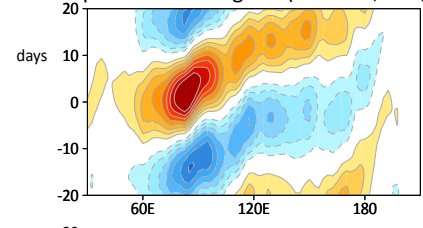
Precip wavenumber(x)-frequency(y) spectra (symmetric)

Precip Hovmoller diagram (10S-10N; mm/day)

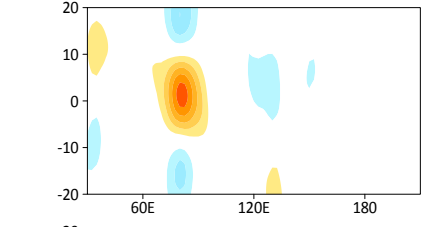
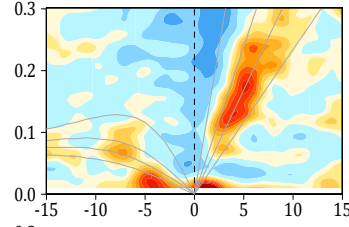
a) GPM



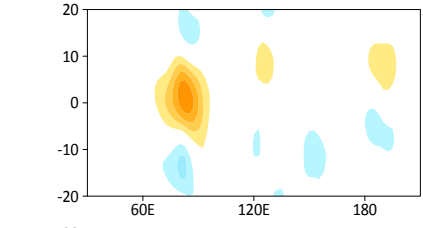
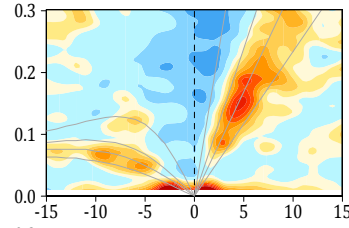
days



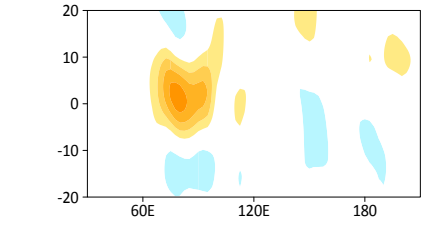
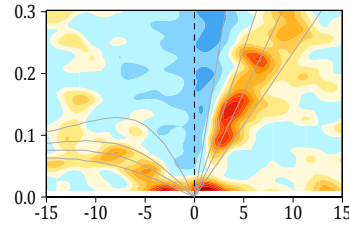
b) CAM6 control experiment



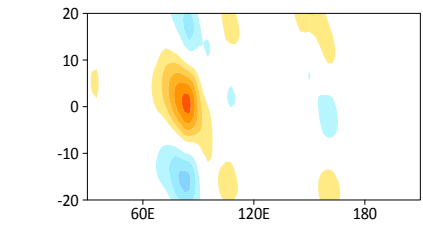
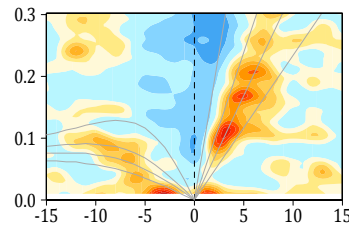
c) 25nup\_1a05b3alph



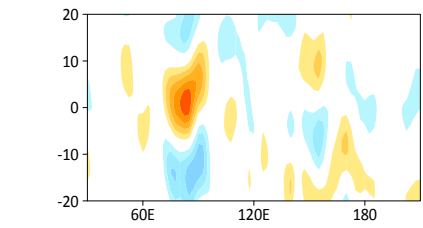
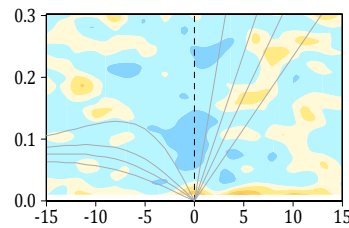
d) 25nup\_1a05b3alph\_dorad



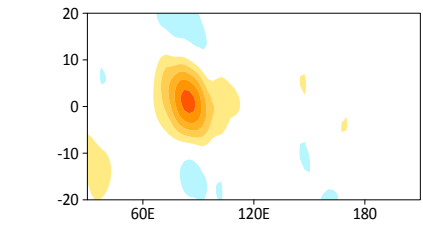
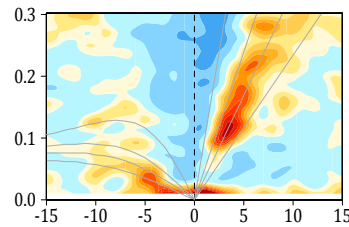
e) 25nup\_1a05b3alph\_halfdiss



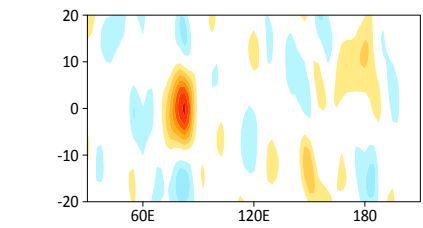
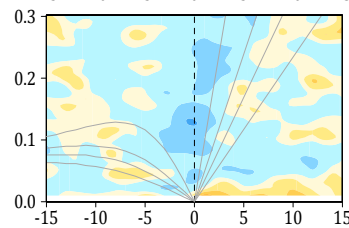
f) 25nup\_1a05b3alph\_nozm



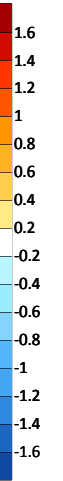
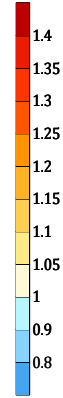
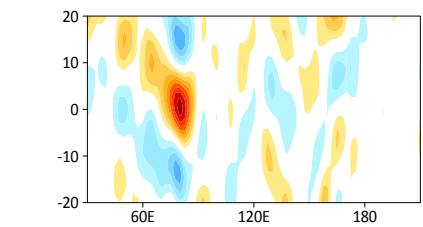
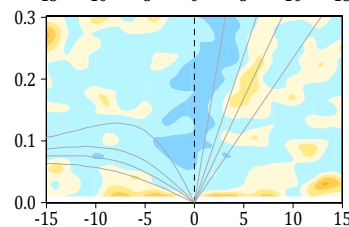
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm



i) 25nup\_2a05b0alph\_as-1alim\_nozm

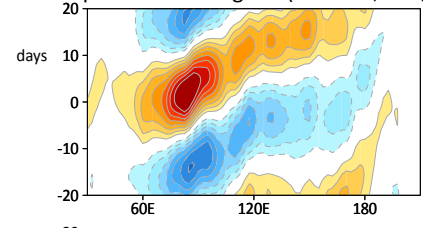
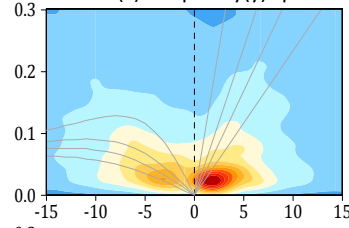




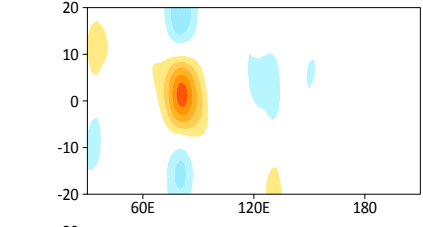
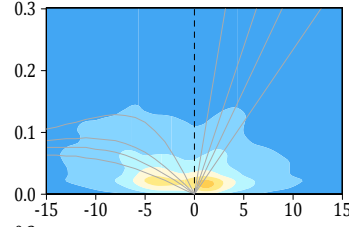
Precip wavenumber(x)-frequency(y) spectra (symmetric)

Precip Hovmoller diagram (10S-10N; mm/day)

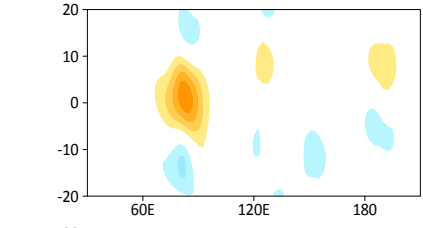
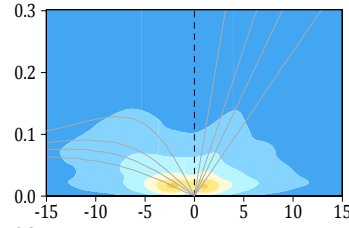
a) GPM



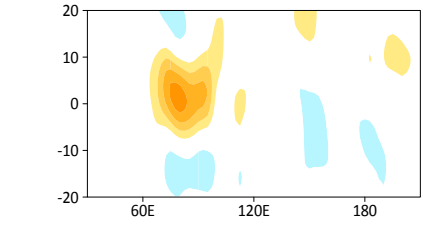
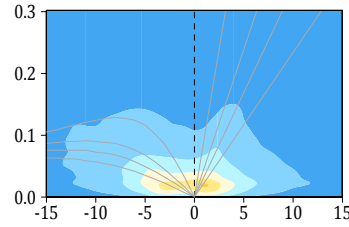
b) CAM6 control experiment



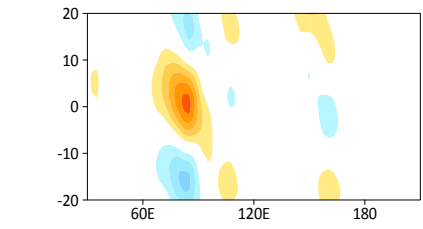
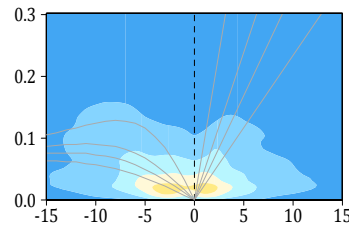
c) 25nup\_1a05b3alph



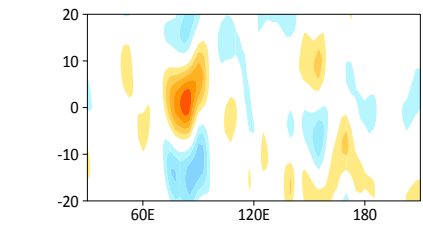
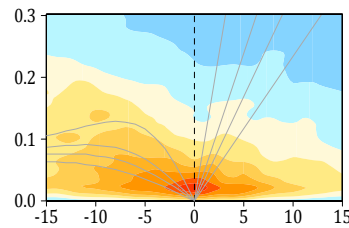
d) 25nup\_1a05b3alph\_dorad



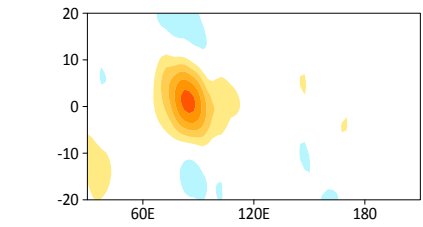
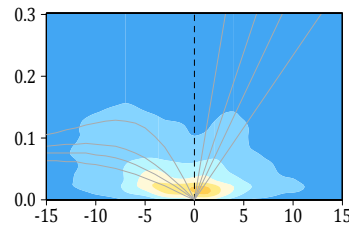
e) 25nup\_1a05b3alph\_halfdiss



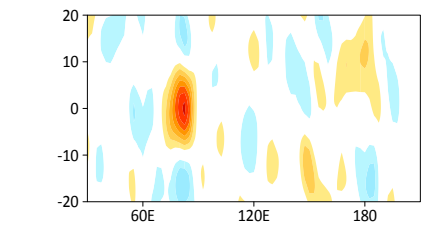
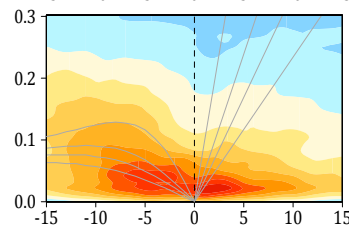
f) 25nup\_1a05b3alph\_nozm



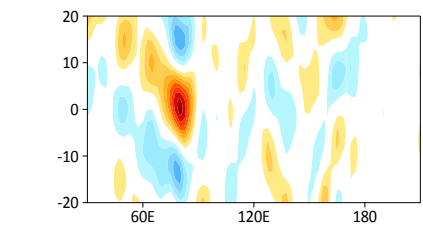
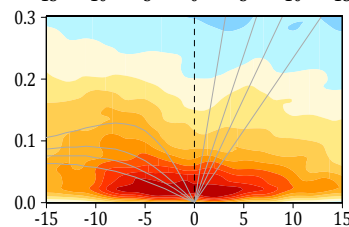
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

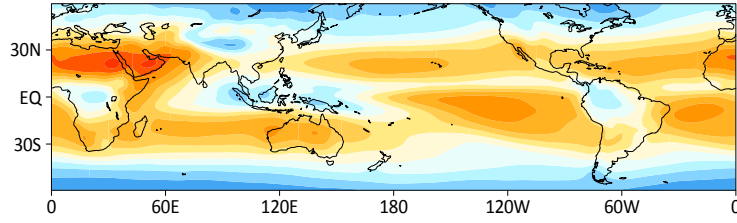


i) 25nup\_2a05b0alph\_as-1alim\_nozm

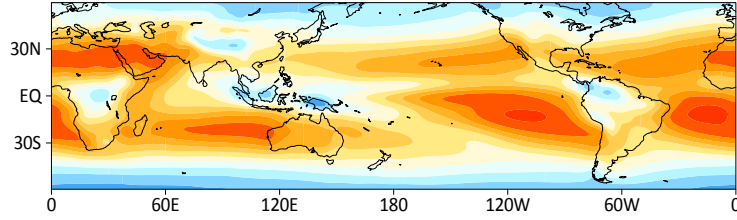


Annual Mean OLR (1998-2007)

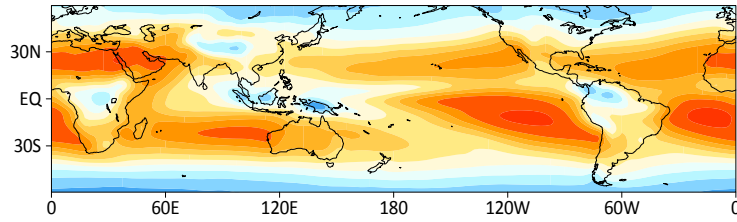
a) NOAA



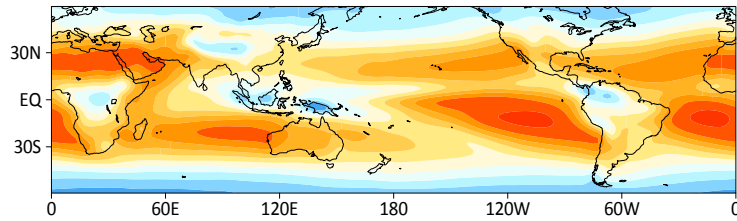
b) CAM6 control experiment



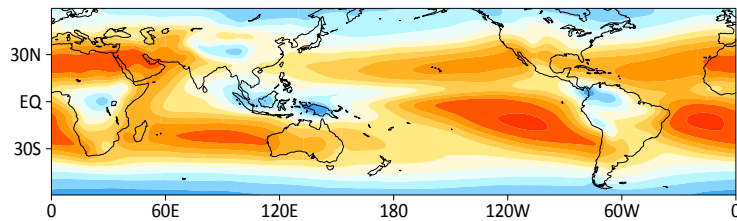
c) 25nup\_1a05b3alph



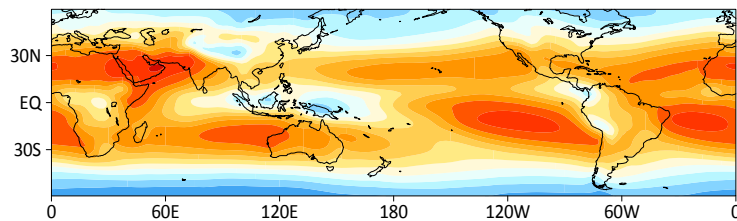
d) 25nup\_1a05b3alph\_dorad



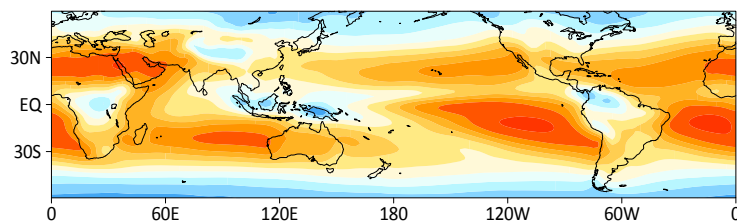
e) 25nup\_1a05b3alph\_halfdiss



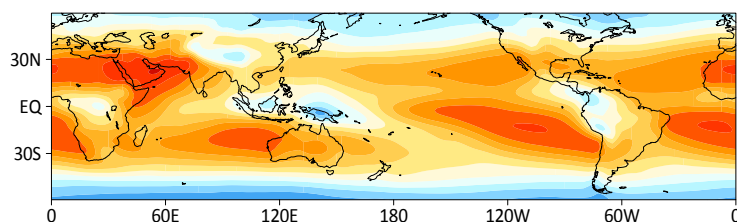
f) 25nup\_1a05b3alph\_nozm



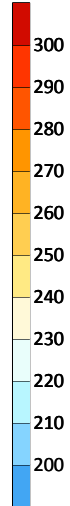
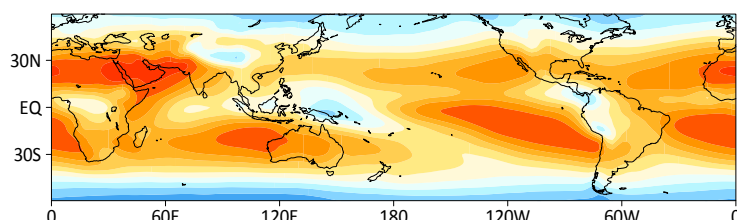
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

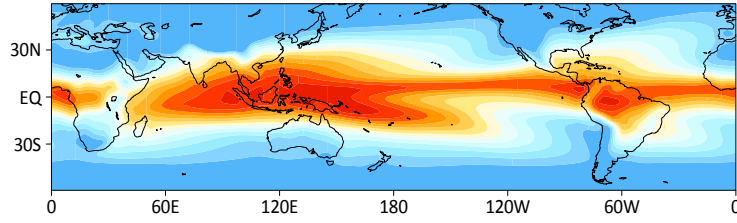


i) 25nup\_2a05b0alph\_as-1alim\_nozm



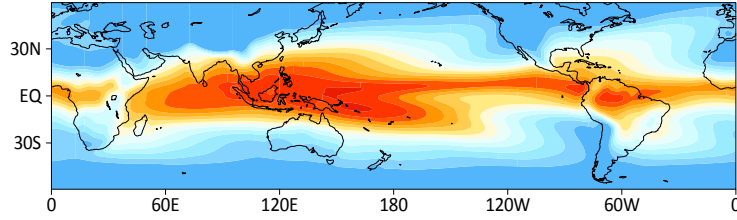
Annual Mean Precipitable Water (1998-2007)

a) ERA5



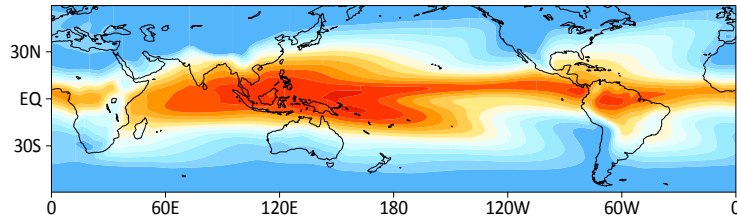
b) CAM6 control experiment

0.993



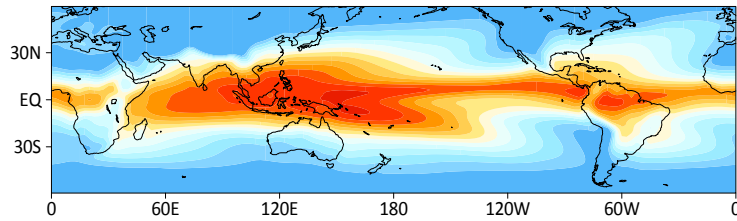
c) 25nup\_1a05b3alph

0.993



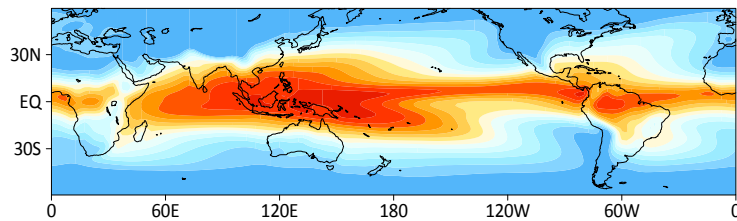
d) 25nup\_1a05b3alph\_dorad

0.993



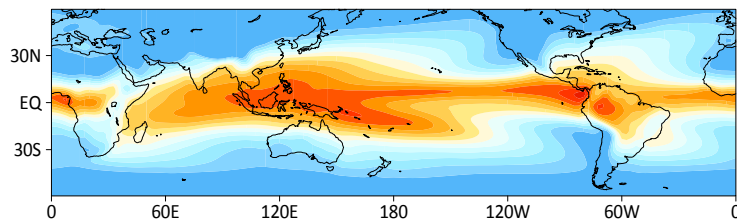
e) 25nup\_1a05b3alph\_halfdiss

0.992



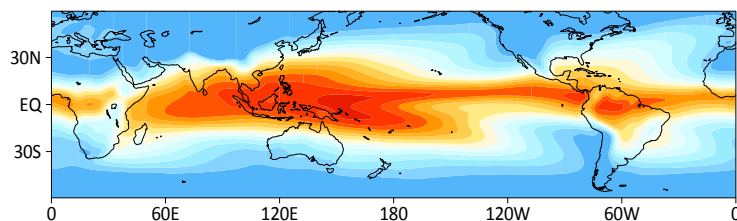
f) 25nup\_1a05b3alph\_nozm

0.990



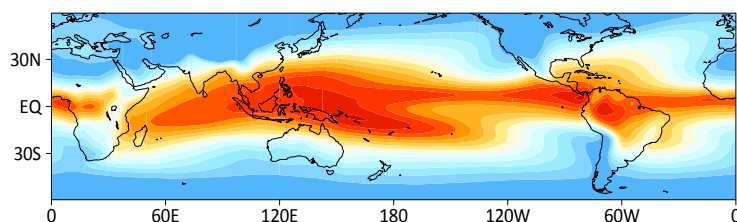
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.992



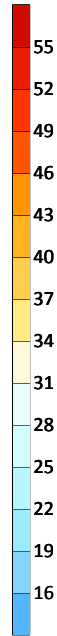
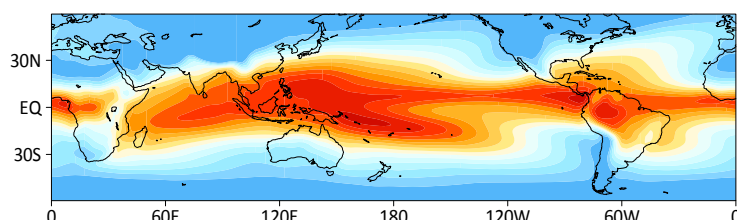
h) 25nup\_2a05b0alph\_nozm

0.987



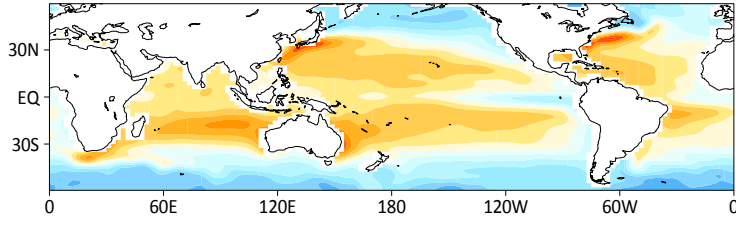
i) 25nup\_2a05b0alph\_as-1alim\_nozm

0.987

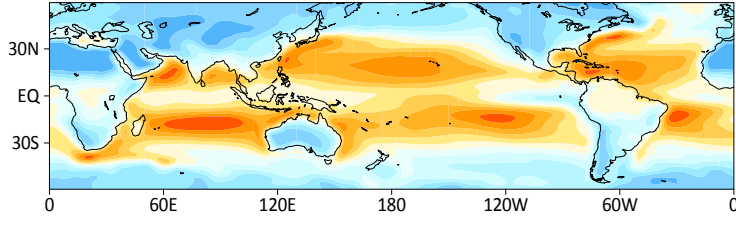


Annual Mean Surface Latent Heat Flux (1998-2007)

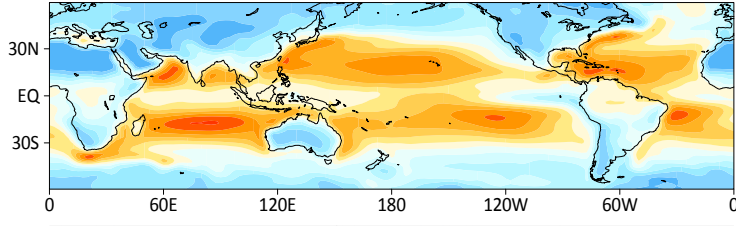
a) OAFlex



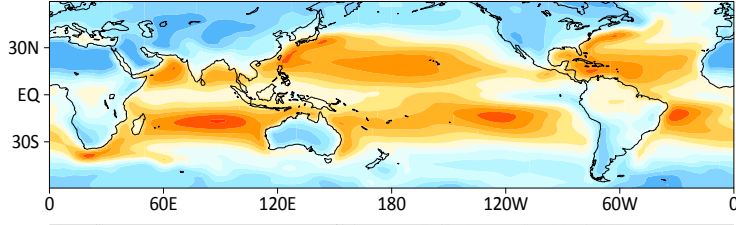
b) CAM6 control experiment  
0.939



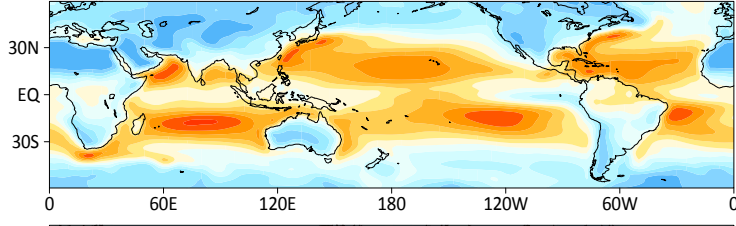
c) 25nup\_1a05b3alph  
0.938



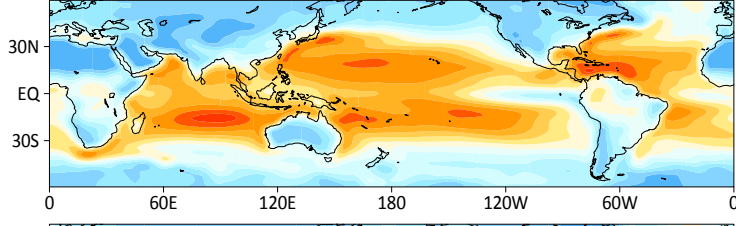
d) 25nup\_1a05b3alph\_dorad  
0.938



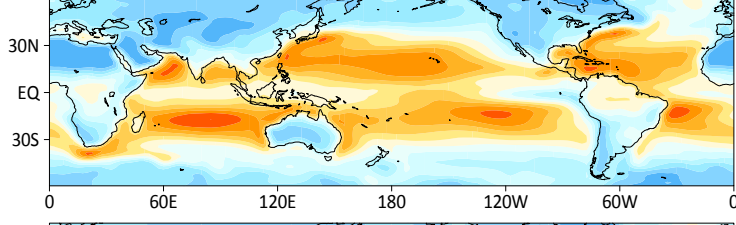
e) 25nup\_1a05b3alph\_halfdiss  
0.926



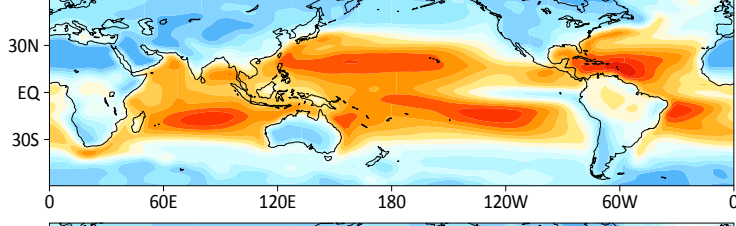
f) 25nup\_1a05b3alph\_nozm  
0.944



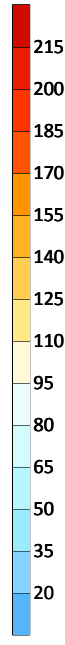
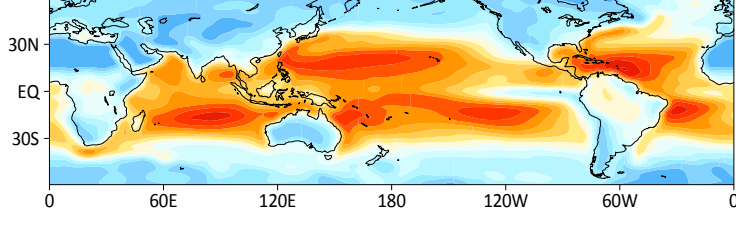
g) 25nup\_1a05b3alph\_aspd-it-1alim  
0.938



h) 25nup\_2a05b0alph\_nozm  
0.916



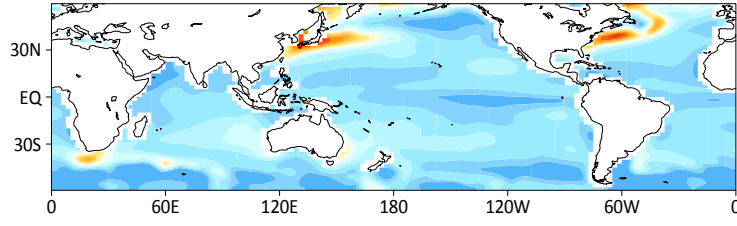
i) 25nup\_2a05b0alph\_as-1alim\_nozm  
0.922





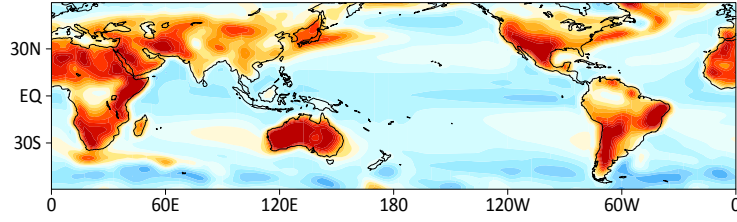
Annual Mean Surface Sensible Heat Flux (1998-2007)

a) OAFlex



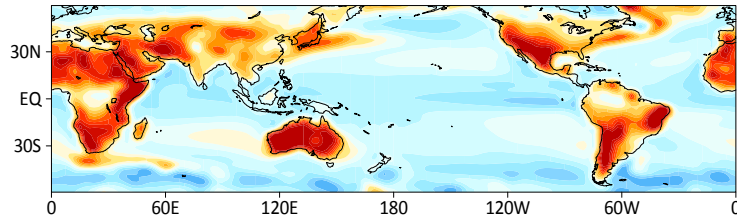
b) CAM6 control experiment

0.771



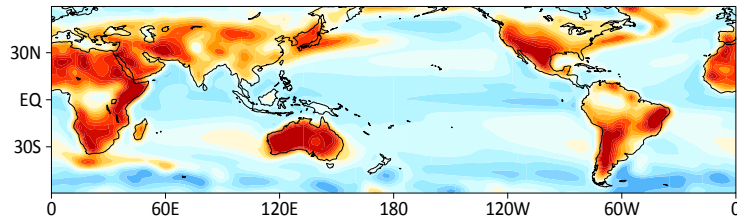
c) 25nup\_1a05b3alph

0.770



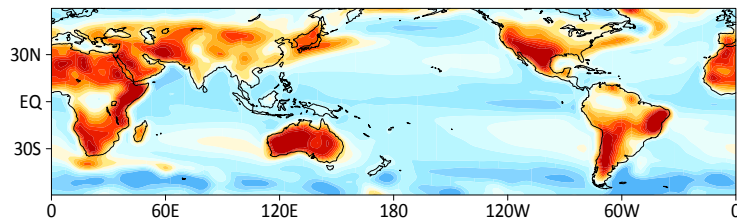
d) 25nup\_1a05b3alph\_dorad

0.773



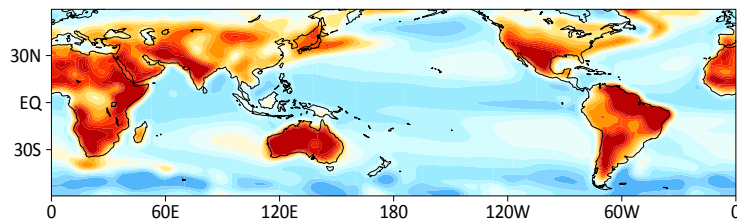
e) 25nup\_1a05b3alph\_halfdiss

0.756



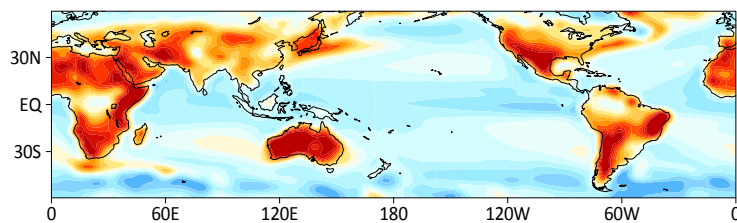
f) 25nup\_1a05b3alph\_nozm

0.726



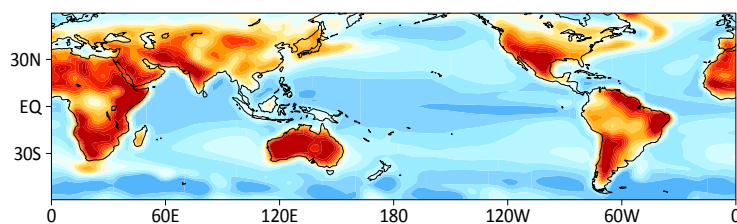
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.773



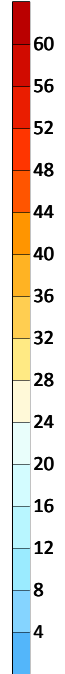
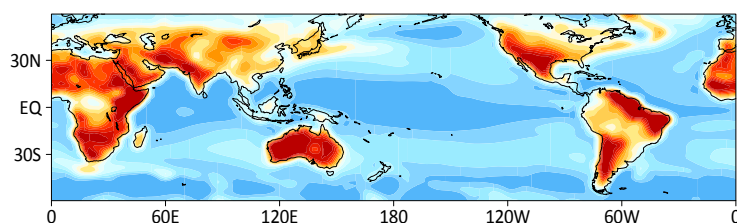
h) 25nup\_2a05b0alph\_nozm

0.716



i) 25nup\_2a05b0alph\_as-1alim\_nozm

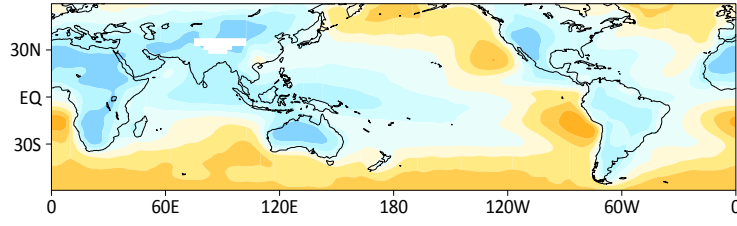
0.715





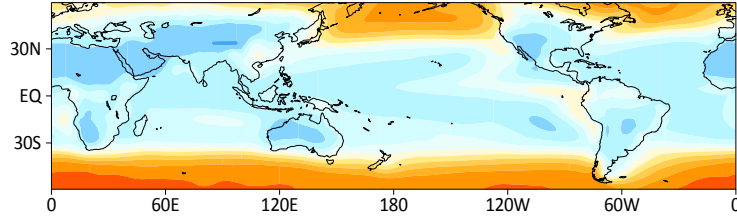
Annual Mean Low-cloud fraction (1998-2007)

a) Calipso



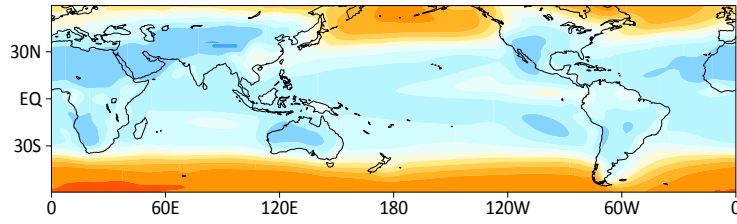
b) CAM6 control experiment

0.541



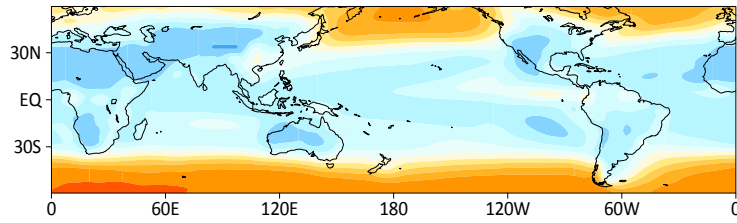
c) 25nup\_1a05b3alph

0.521



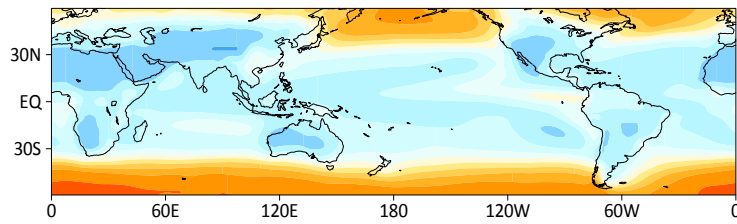
d) 25nup\_1a05b3alph\_dorad

0.524



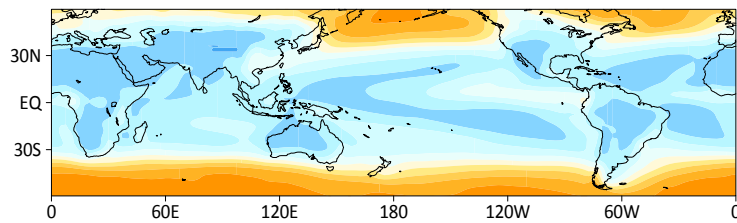
e) 25nup\_1a05b3alph\_halfdiss

0.529



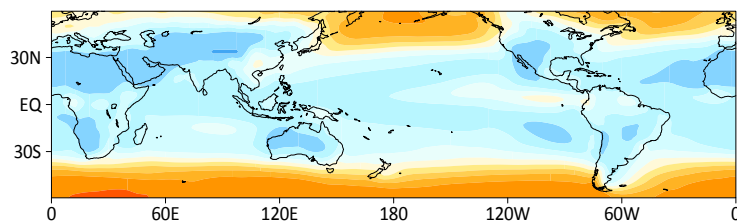
f) 25nup\_1a05b3alph\_nozm

0.569



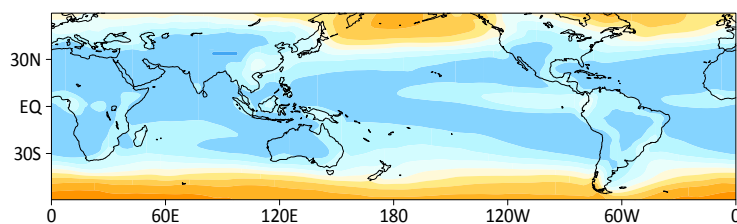
g) 25nup\_1a05b3alph\_aspd-it-1alim

0.514



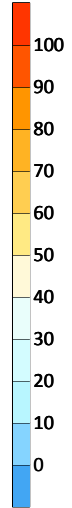
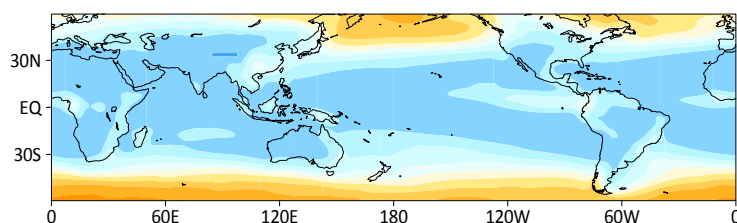
h) 25nup\_2a05b0alph\_nozm

0.534



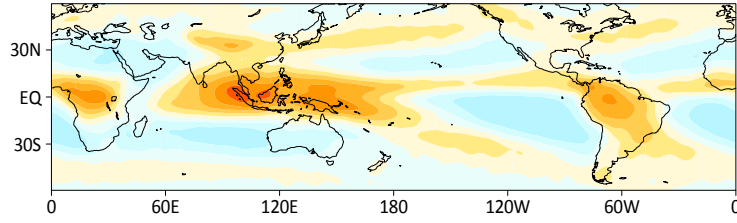
i) 25nup\_2a05b0alph\_as-1alim\_nozm

0.537

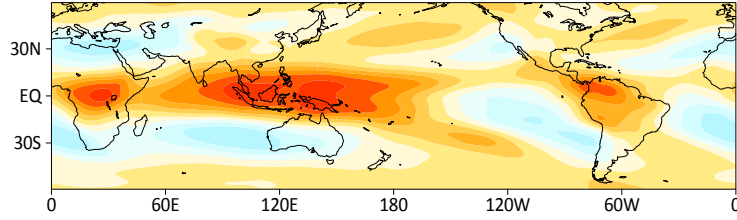


Annual Mean High-cloud fraction (1998-2007)

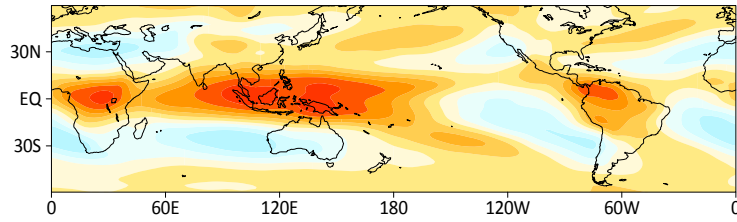
a) Calipso



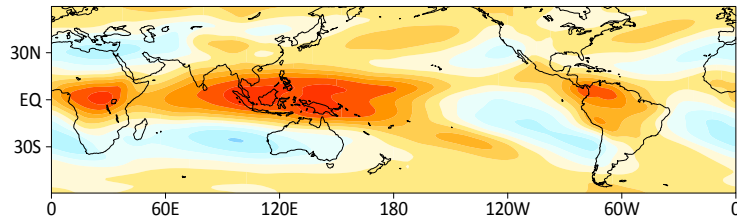
b) CAM6 control experiment



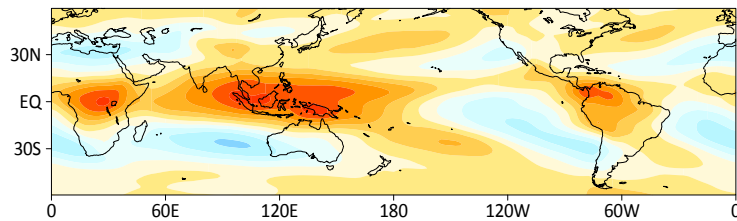
c) 25nup\_1a05b3alph



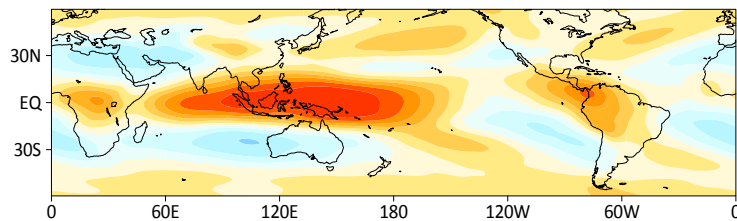
d) 25nup\_1a05b3alph\_dorad



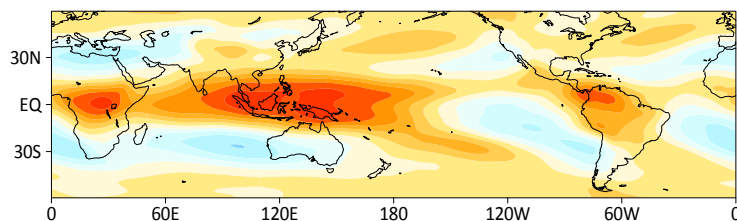
e) 25nup\_1a05b3alph\_halfdiss



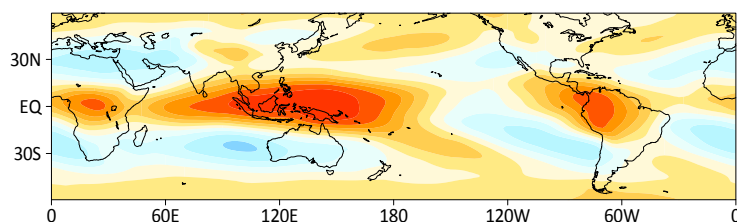
f) 25nup\_1a05b3alph\_nozm



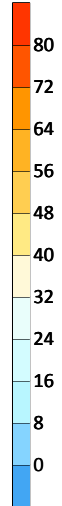
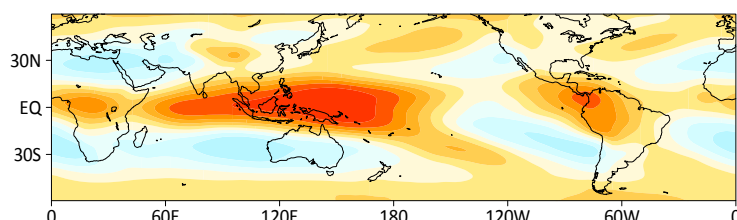
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

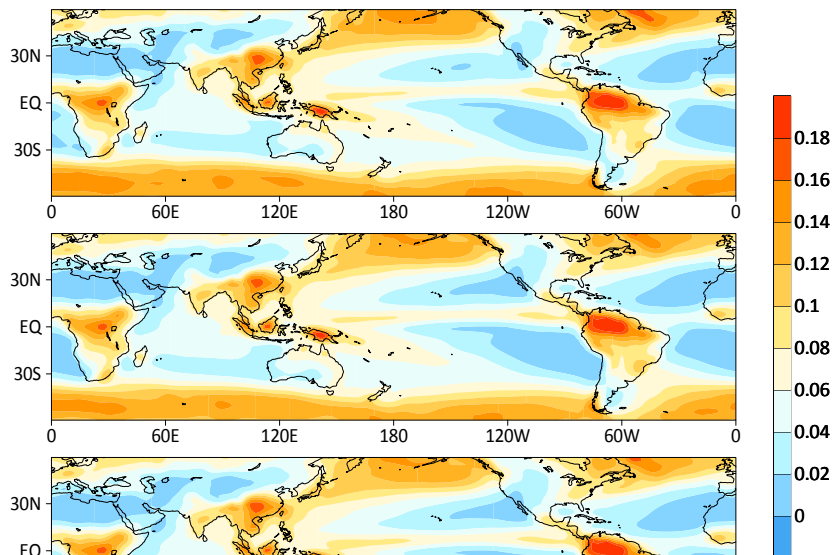


i) 25nup\_2a05b0alph\_as-1alim\_nozm

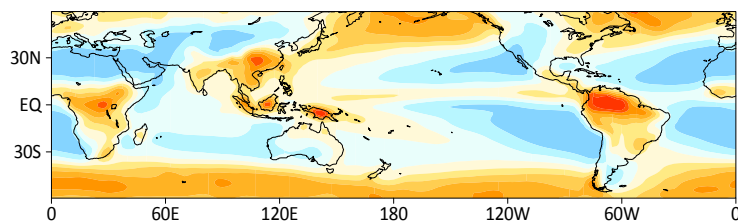


Annual Mean Total Cloud Water Path (1998-2007)

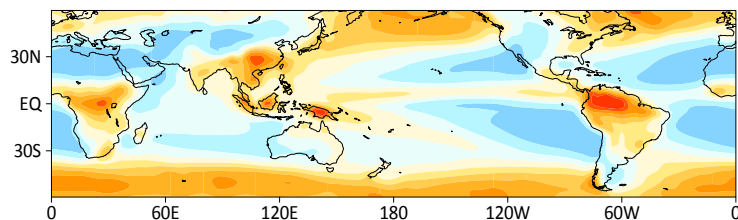
b) CAM6 control experiment



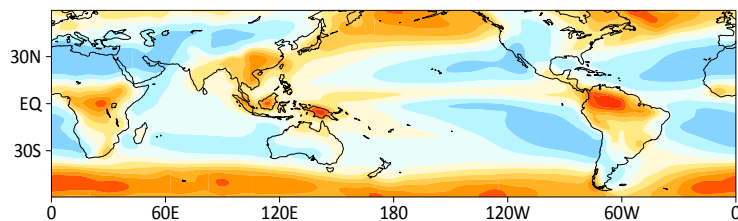
c) 25nup\_1a05b3alph



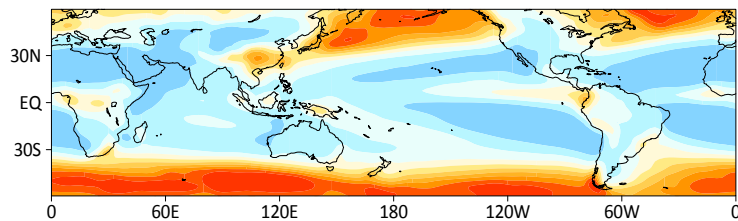
d) 25nup\_1a05b3alph\_dorad



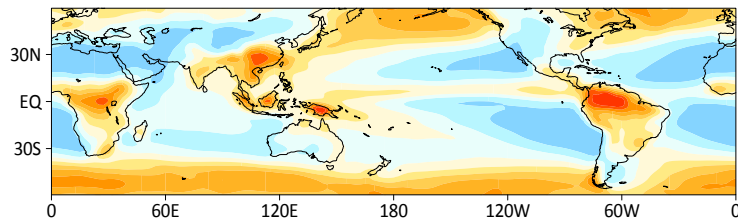
e) 25nup\_1a05b3alph\_halfdiss



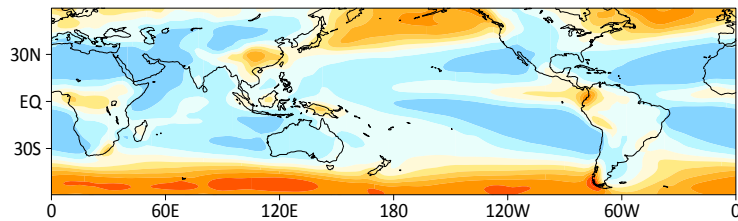
f) 25nup\_1a05b3alph\_nozm



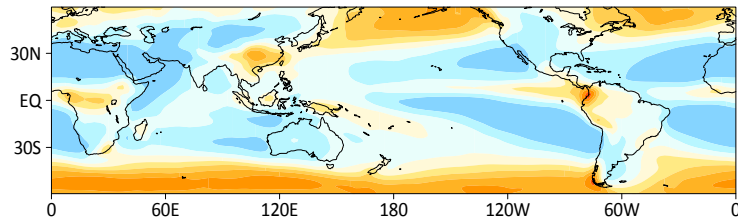
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

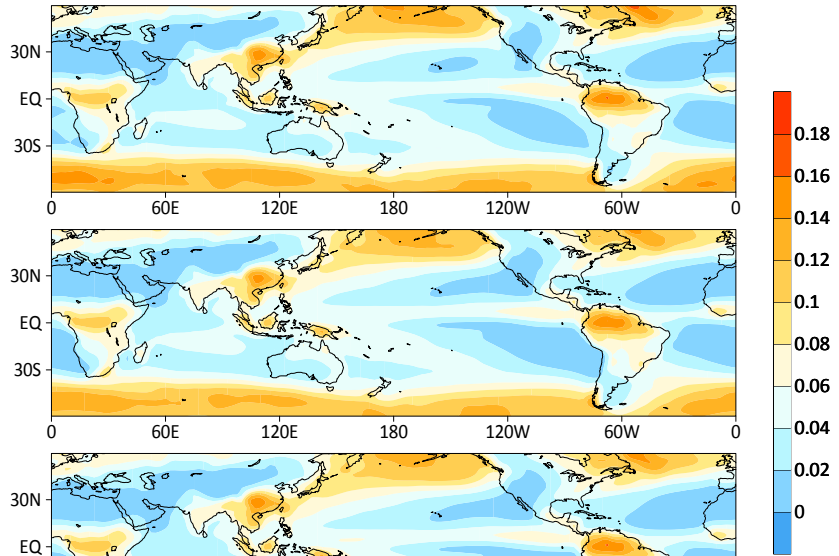


i) 25nup\_2a05b0alph\_as-1alim\_nozm

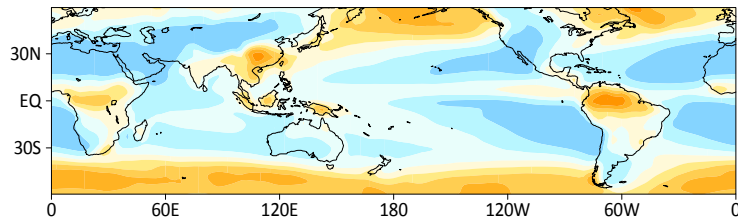


Annual Mean Cloud Liquid Water Path (1998-2007)

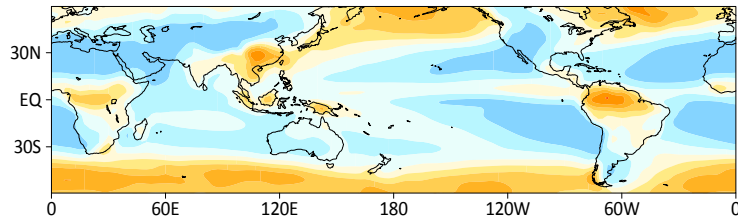
b) CAM6 control experiment



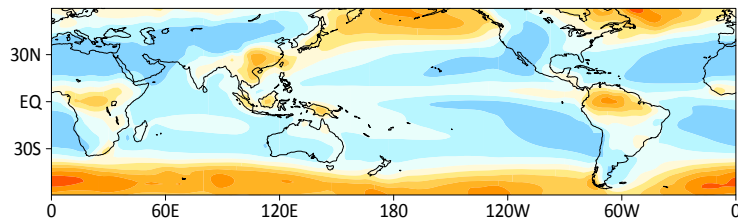
c) 25nup\_1a05b3alph



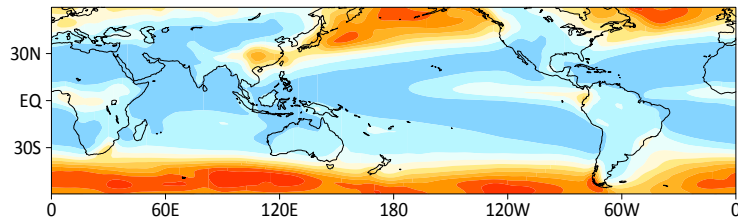
d) 25nup\_1a05b3alph\_dorad



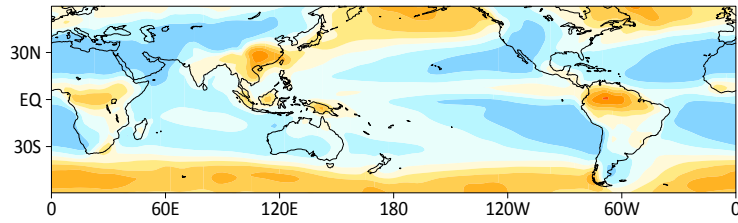
e) 25nup\_1a05b3alph\_halfdiss



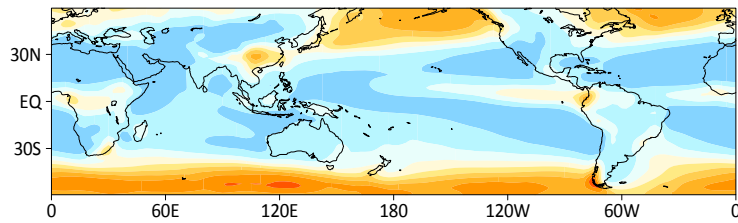
f) 25nup\_1a05b3alph\_nozm



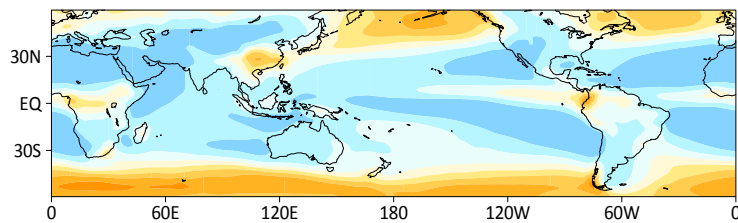
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

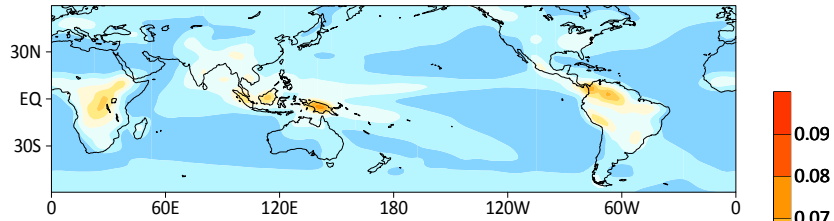


i) 25nup\_2a05b0alph\_as-1alim\_nozm

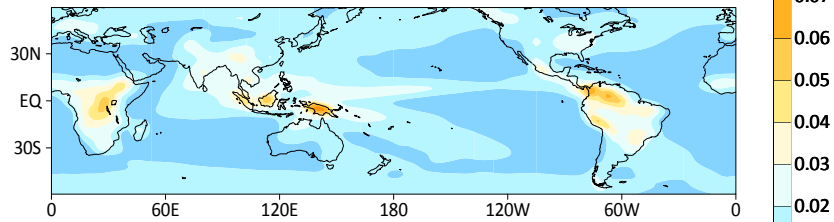


Annual Mean Cloud Ice Water Path (1998-2007)

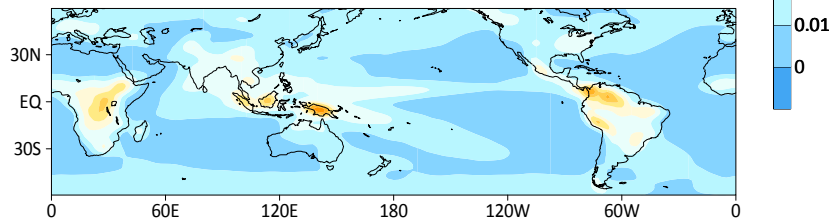
b) CAM6 control experiment



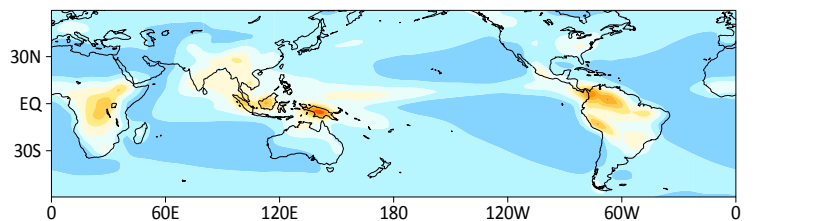
c) 25nup\_1a05b3alph



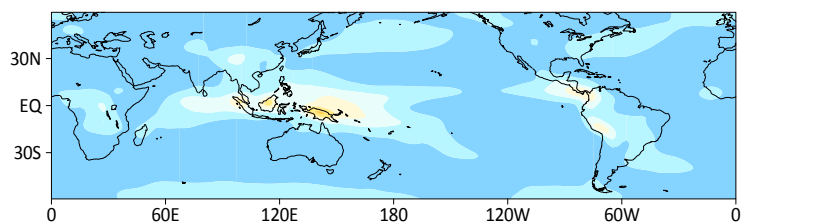
d) 25nup\_1a05b3alph\_dorad



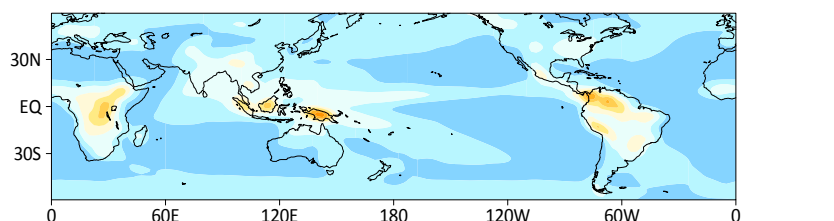
e) 25nup\_1a05b3alph\_halfdiss



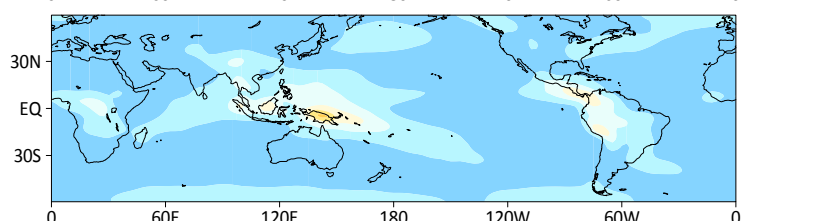
f) 25nup\_1a05b3alph\_nozm



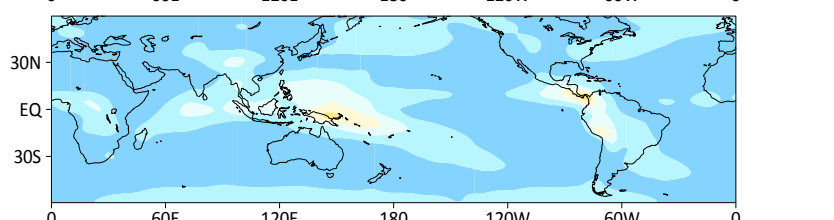
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm



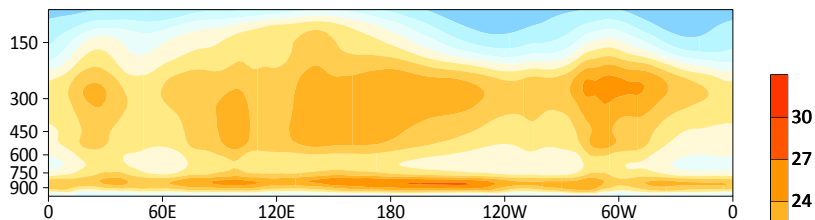
i) 25nup\_2a05b0alph\_as-1alim\_nozm



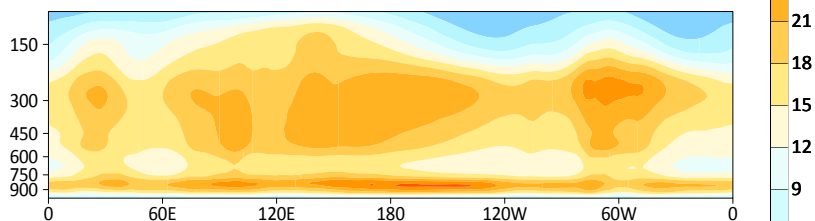


Annual Mean Cloud Fraction (1998-2007)

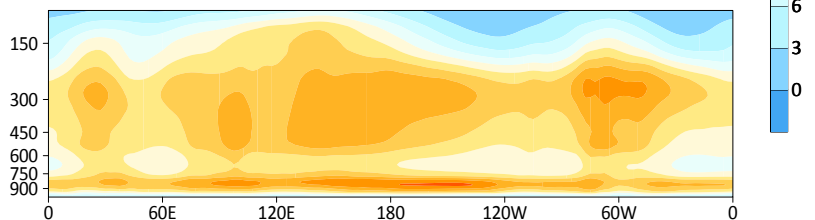
b) CAM6 control experiment



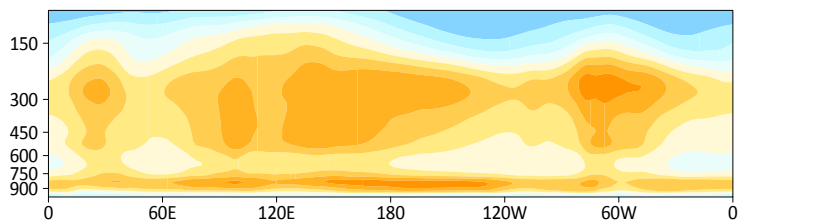
c) 25nup\_1a05b3alph



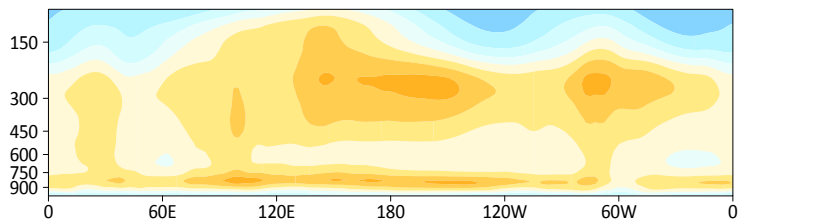
d) 25nup\_1a05b3alph\_dorad



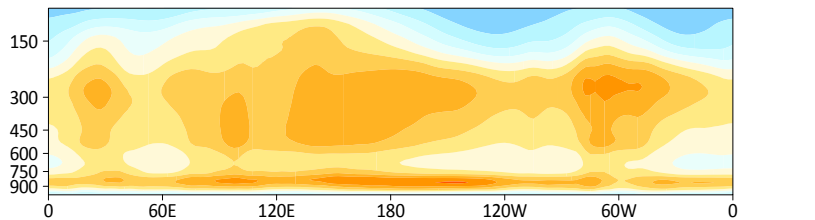
e) 25nup\_1a05b3alph\_halfdiss



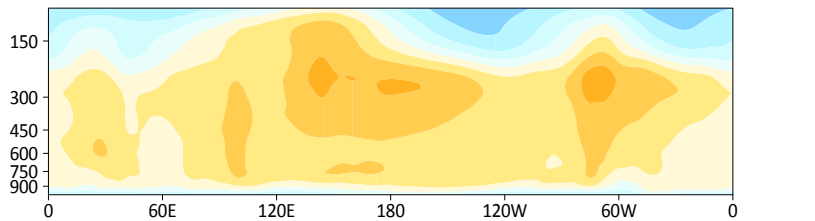
f) 25nup\_1a05b3alph\_nozm



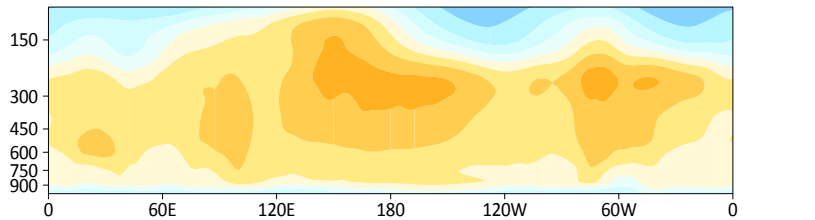
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

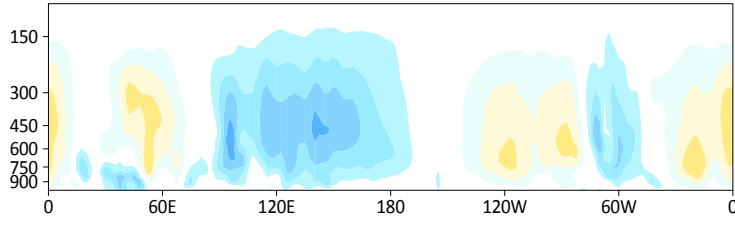


i) 25nup\_2a05b0alph\_as-1alim\_nozm

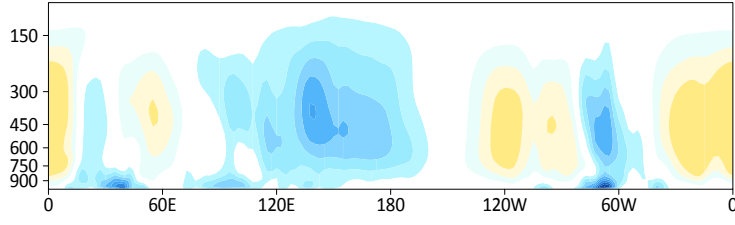


Annual Mean Vertical Velocity (30S-30N; 1998-2007)

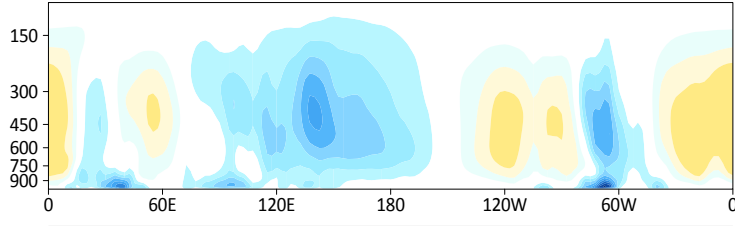
a) ERA5



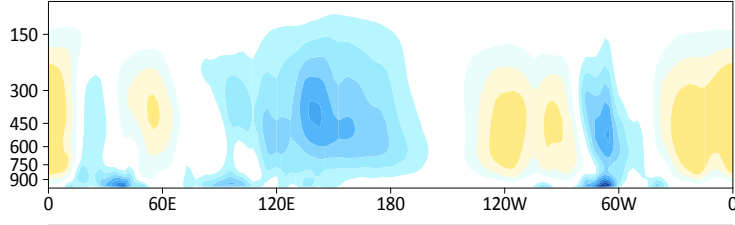
b) CAM6 control experiment



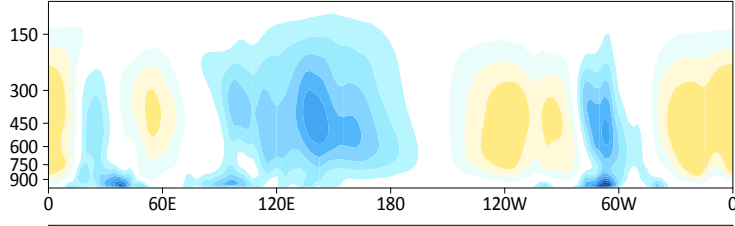
c) 25nup\_1a05b3alph



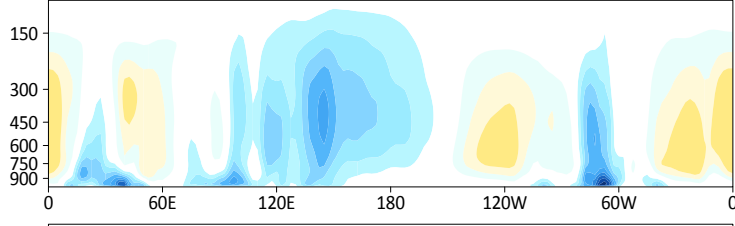
d) 25nup\_1a05b3alph\_dorad



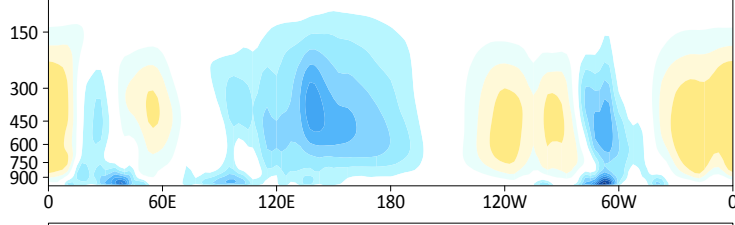
e) 25nup\_1a05b3alph\_halfdiss



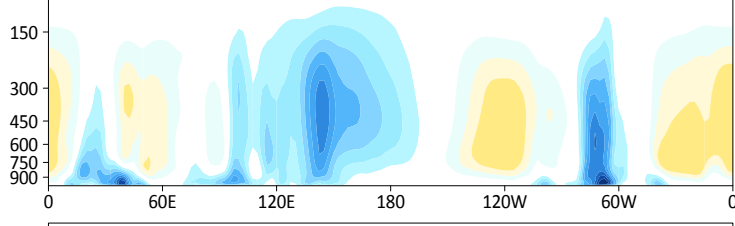
f) 25nup\_1a05b3alph\_nozm



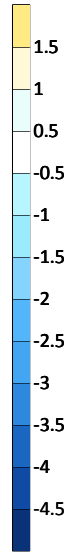
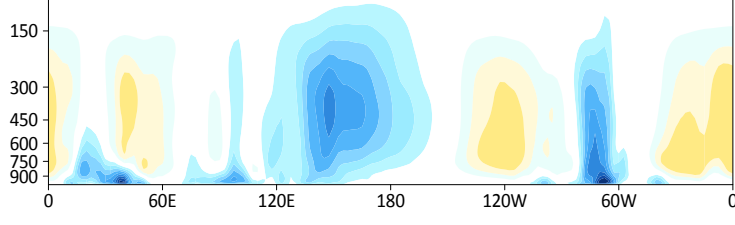
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

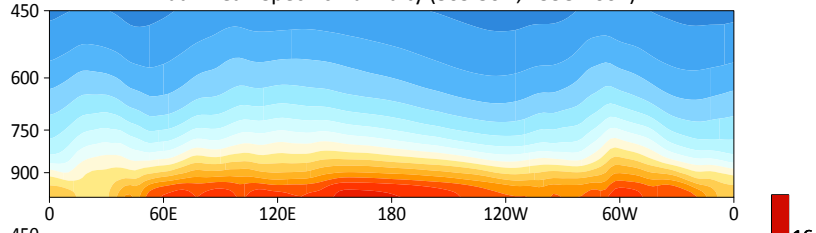


i) 25nup\_2a05b0alph\_as-1alim\_nozm

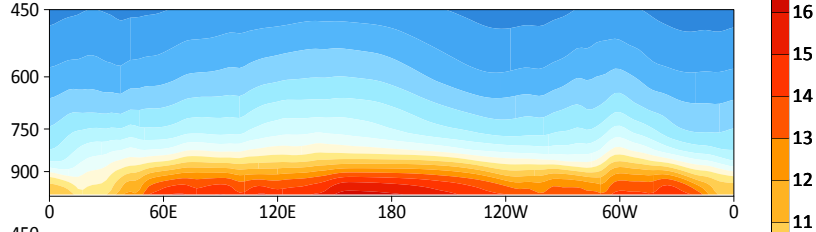


Annual Mean Specific Humidity (30S-30N; 1998-2007)

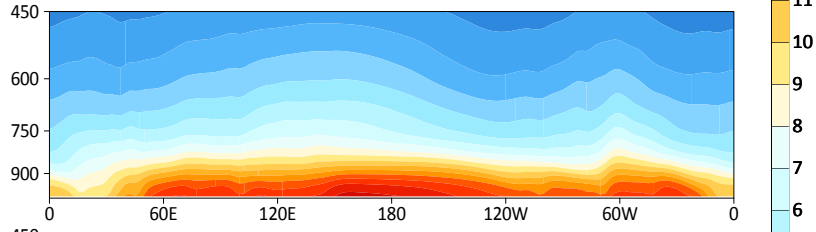
a) ERA5



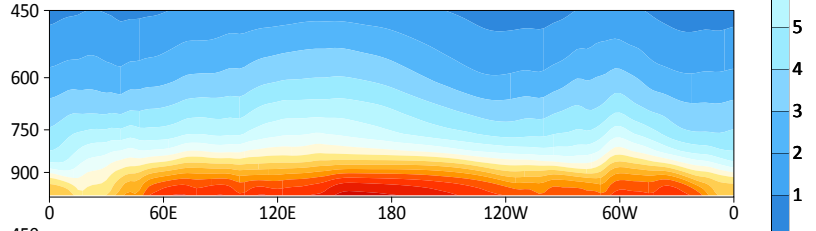
b) CAM6 control experiment



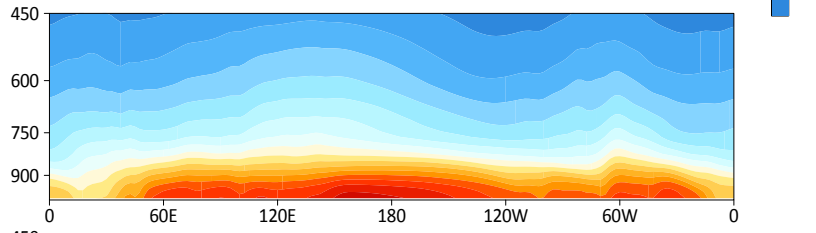
c) 25nup\_1a05b3alph



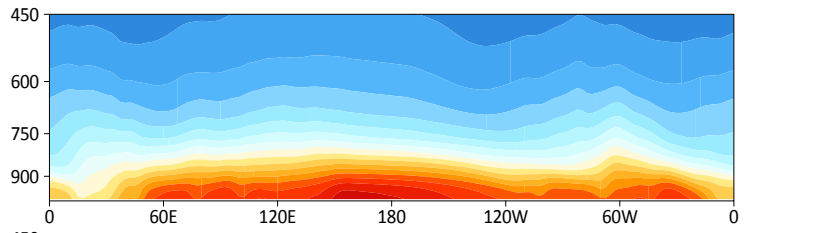
d) 25nup\_1a05b3alph\_dorad



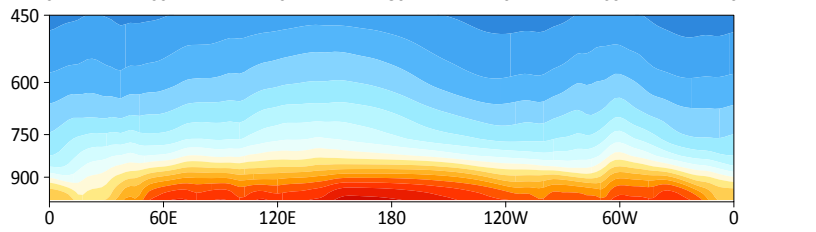
e) 25nup\_1a05b3alph\_halfdiss



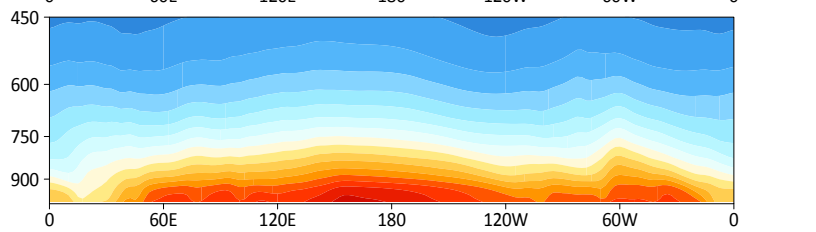
f) 25nup\_1a05b3alph\_nozm



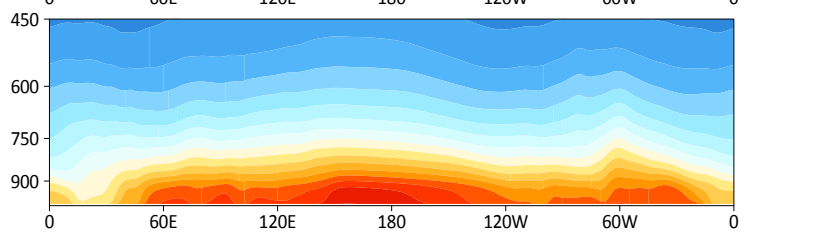
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

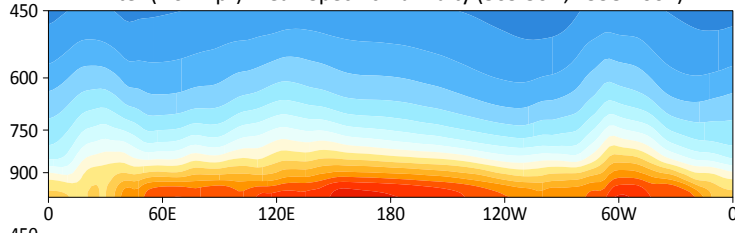


i) 25nup\_2a05b0alph\_as-1alim\_nozm

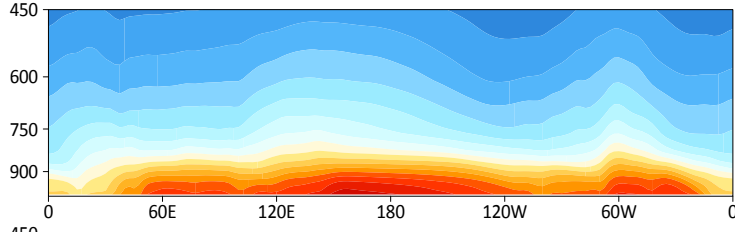


Winter (Nov-Apr) Mean Specific Humidity (30S-30N; 1998-2007)

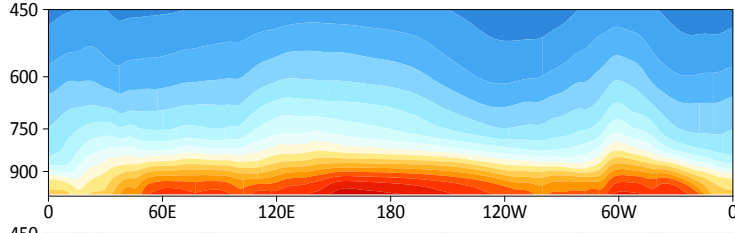
a) ERA5



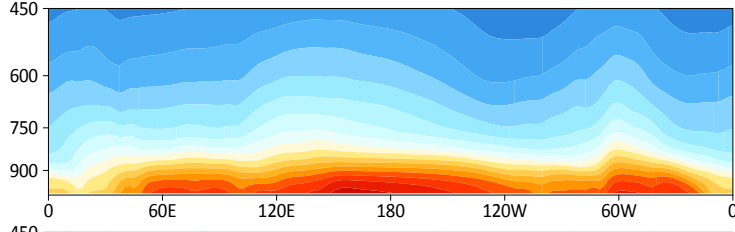
b) CAM6 control experiment



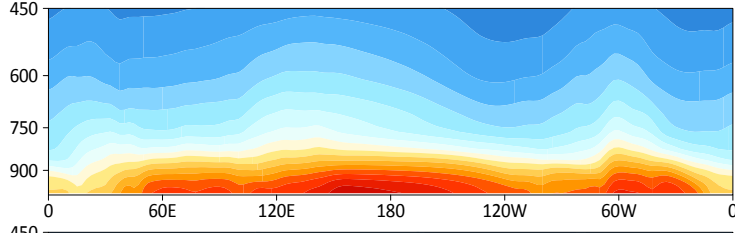
c) 25nup\_1a05b3alph



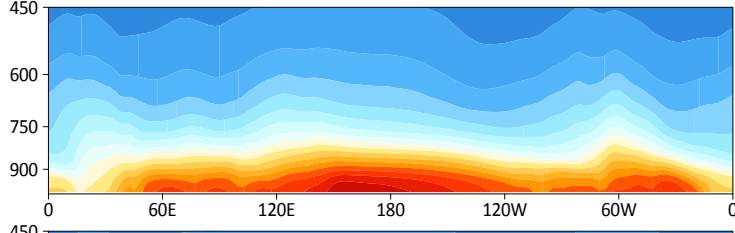
d) 25nup\_1a05b3alph\_dorad



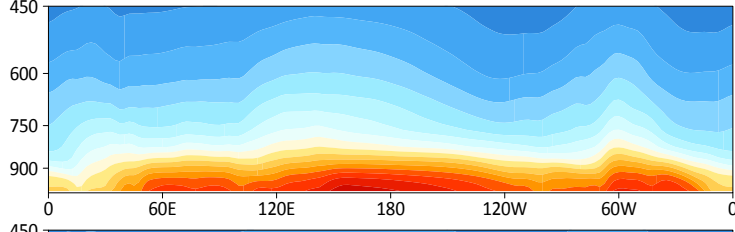
e) 25nup\_1a05b3alph\_halfdiss



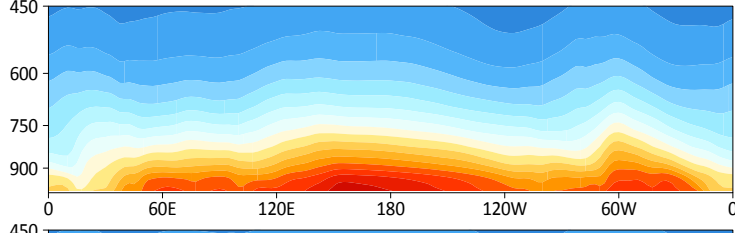
f) 25nup\_1a05b3alph\_nozm



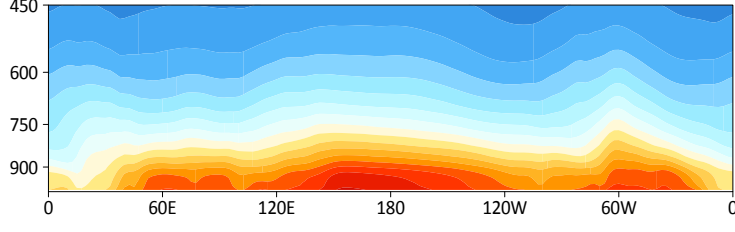
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

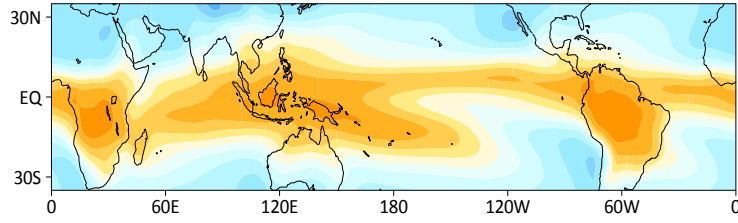


i) 25nup\_2a05b0alph\_as-1alim\_nozm

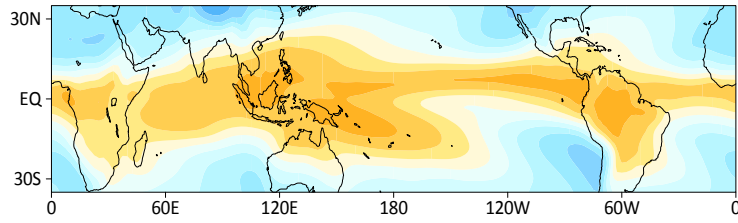


Winter (Nov-Apr) Mean 900-650hPa Specific Humidity (1998-2007)

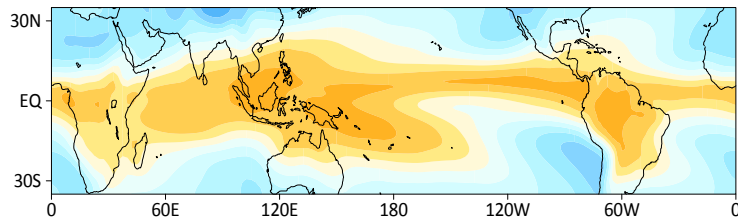
a) ERA5



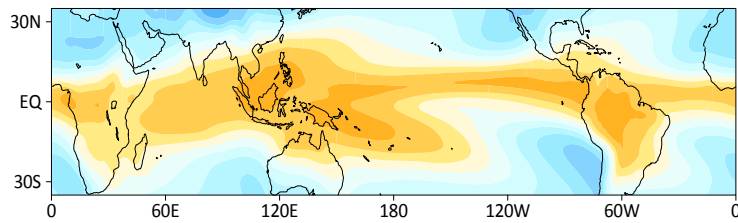
b) CAM6 control experiment



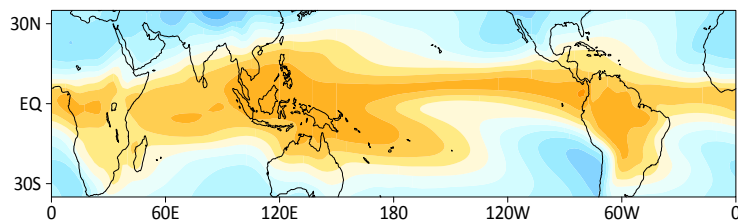
c) 25nup\_1a05b3alph



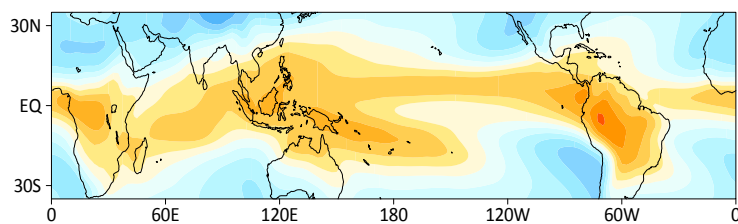
d) 25nup\_1a05b3alph\_dorad



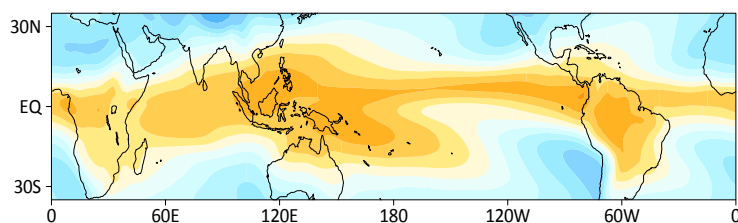
e) 25nup\_1a05b3alph\_halfdiss



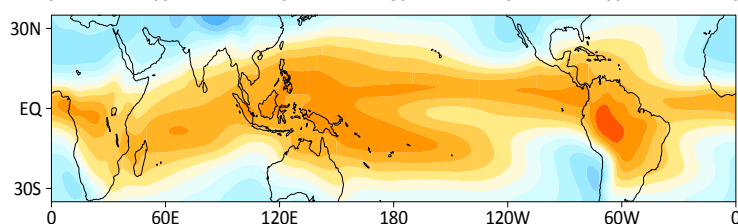
f) 25nup\_1a05b3alph\_nozm



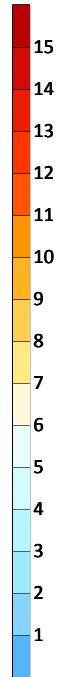
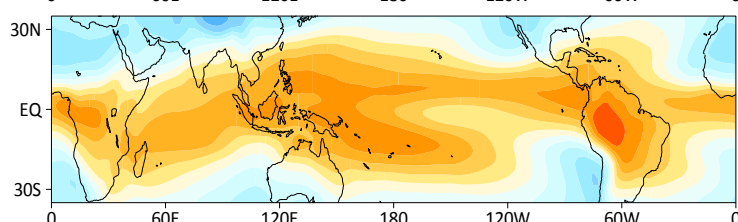
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm



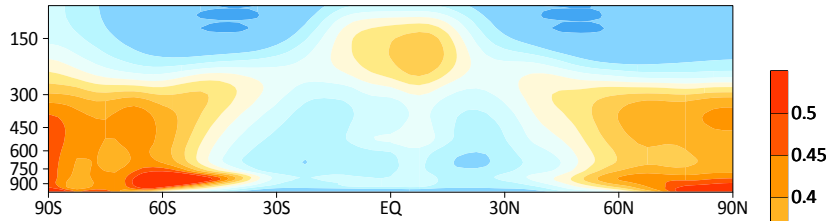
i) 25nup\_2a05b0alph\_as-1alim\_nozm



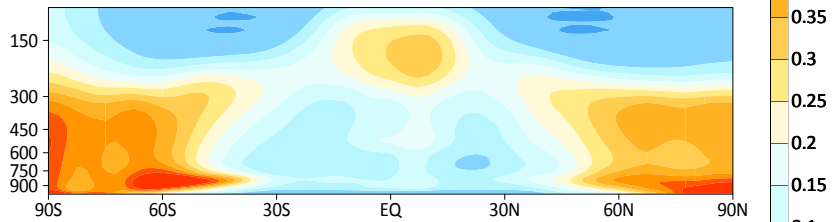


Annual Global Zonal Mean Cloud Fraction (1998-2007)

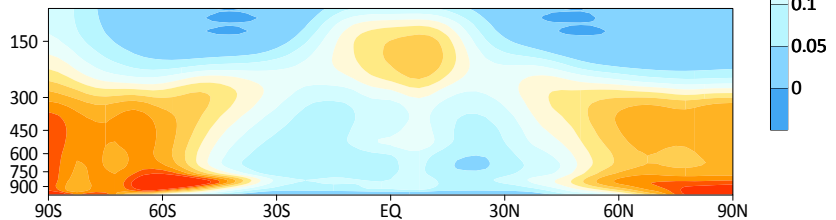
b) CAM6 control experiment



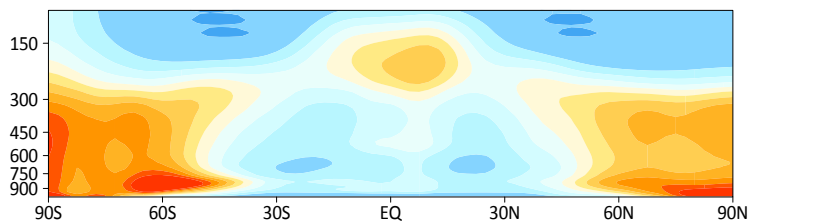
c) 25nup\_1a05b3alph



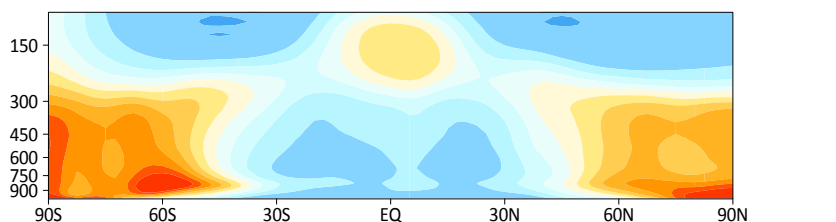
d) 25nup\_1a05b3alph\_dorad



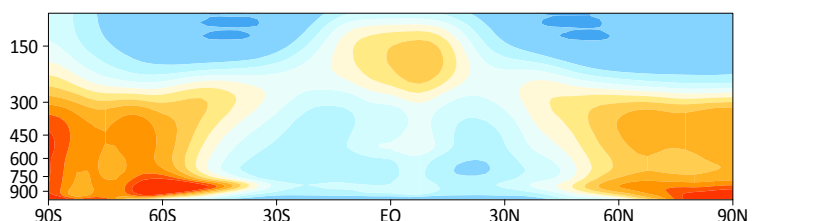
e) 25nup\_1a05b3alph\_halfdiss



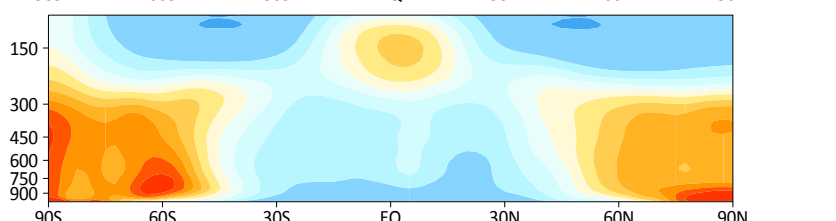
f) 25nup\_1a05b3alph\_nozm



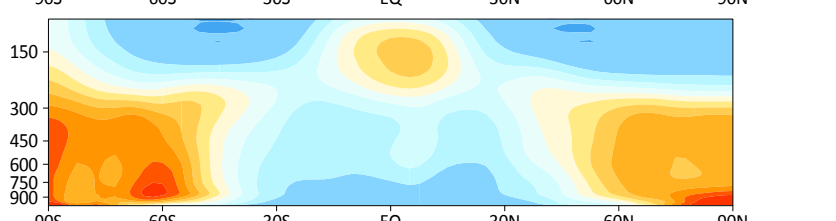
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

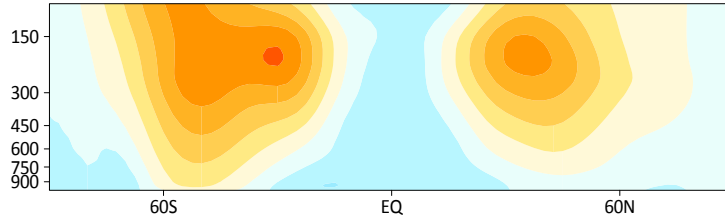


i) 25nup\_2a05b0alph\_as-1alim\_nozm

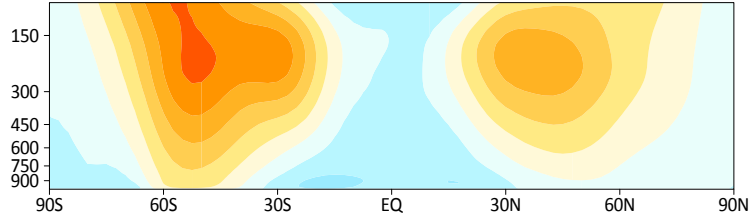


Annual Zonal Mean Zonal-wind (1998-2007)

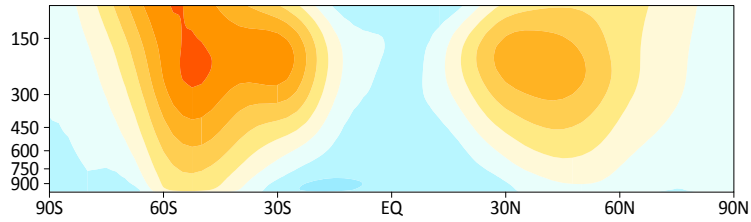
a) ERA5



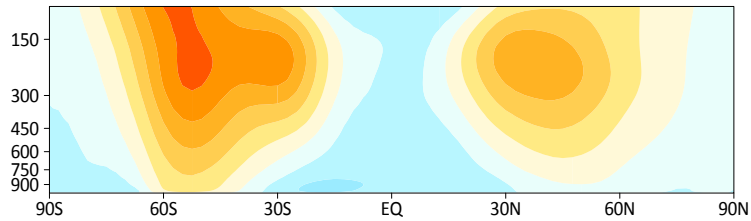
b) CAM6 control experiment



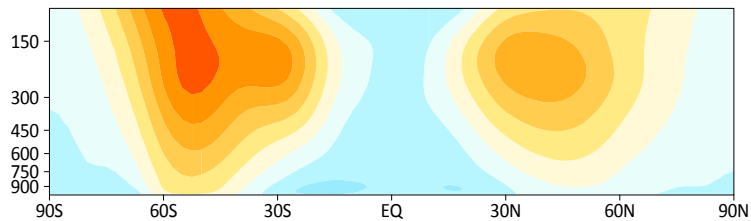
c) 25nup\_1a05b3alph



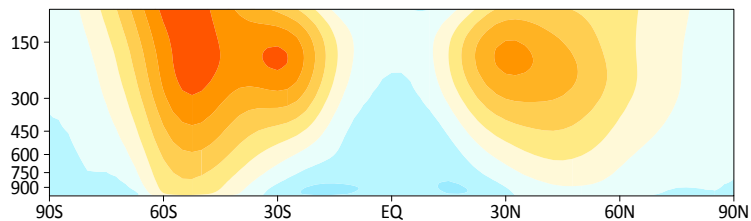
d) 25nup\_1a05b3alph\_dorad



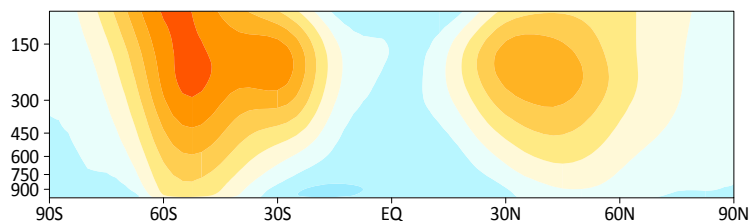
e) 25nup\_1a05b3alph\_halfdiss



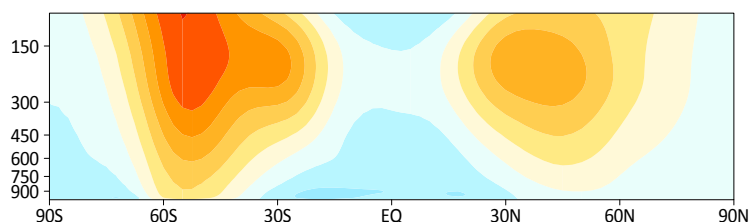
f) 25nup\_1a05b3alph\_nozm



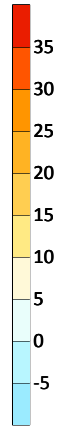
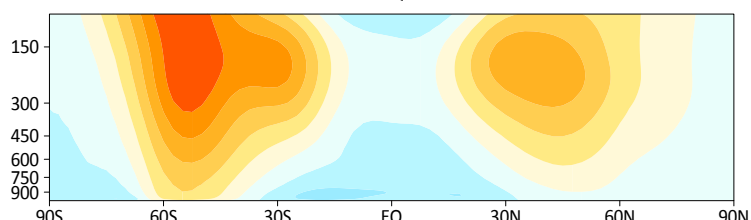
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

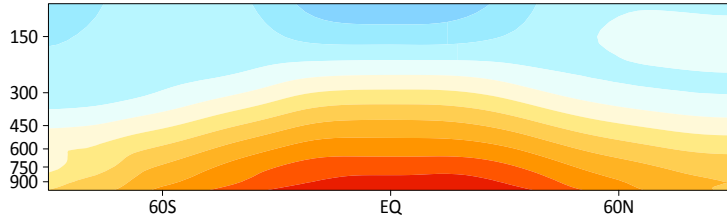


i) 25nup\_2a05b0alph\_as-1alim\_nozm

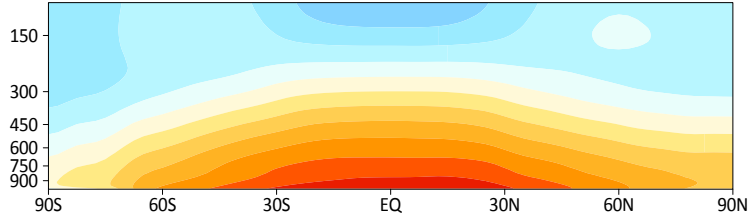


Annual Global Zonal Mean Temperature (1998-2007)

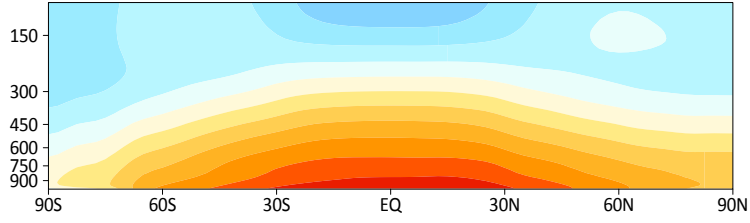
a) ERA5



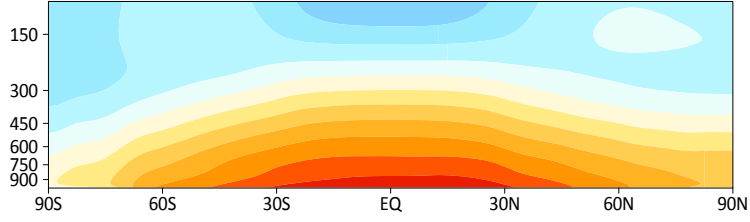
b) CAM6 control experiment



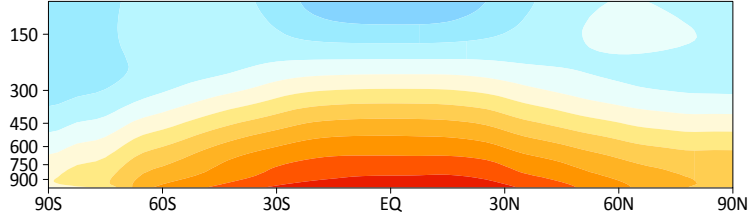
c) 25nup\_1a05b3alph



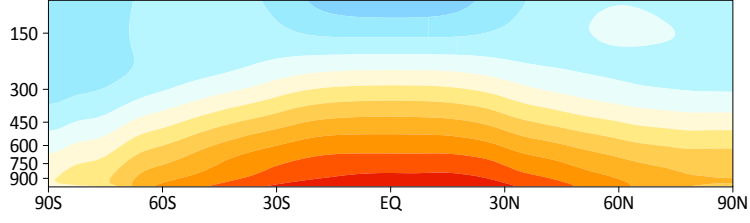
d) 25nup\_1a05b3alph\_dorad



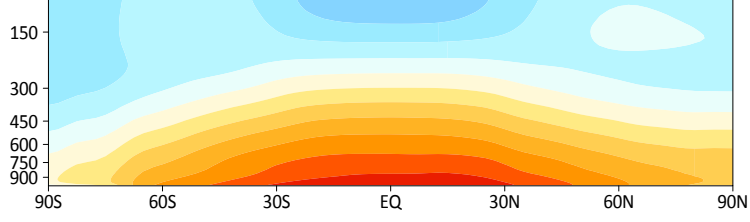
e) 25nup\_1a05b3alph\_halfdiss



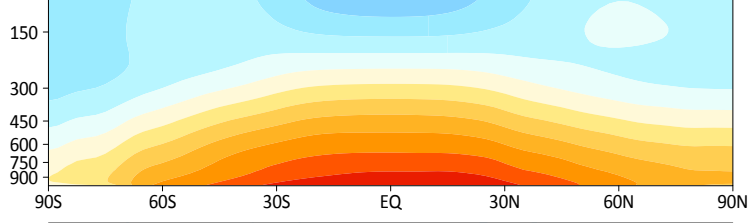
f) 25nup\_1a05b3alph\_nozm



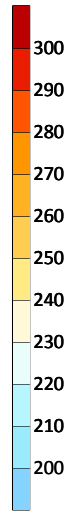
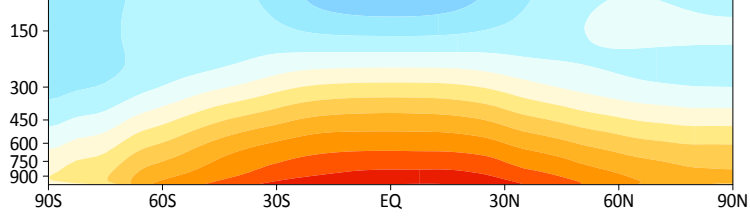
g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm

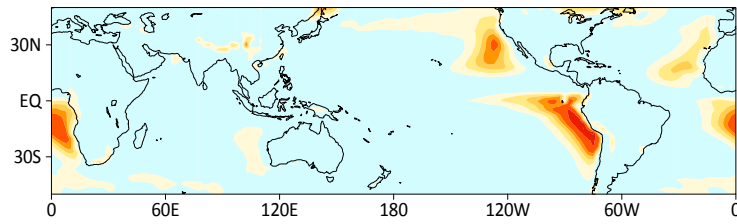


i) 25nup\_2a05b0alph\_as-1alim\_nozm

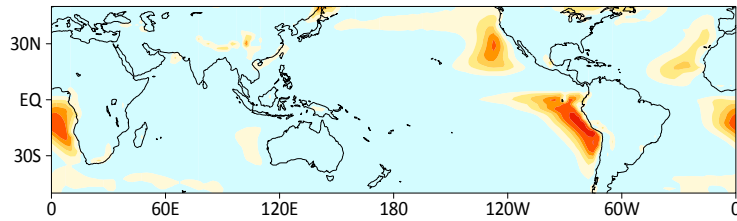


Annual Mean EDMF\_cloudfrac at 920hPa (1998-2007): 0.1%

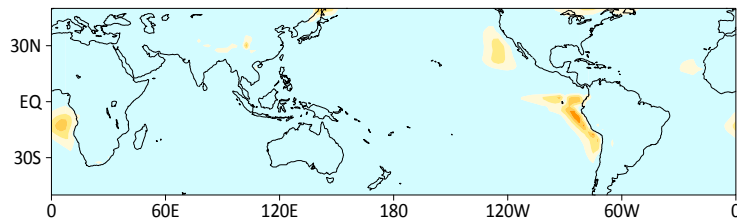
c) 25nup\_1a05b3alph



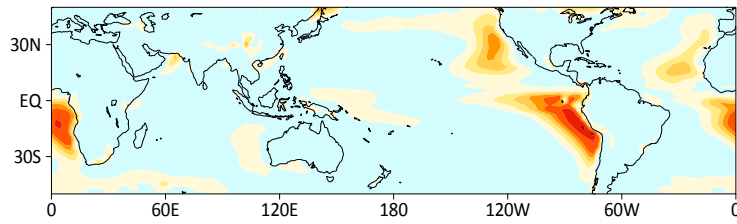
d) 25nup\_1a05b3alph\_dorad



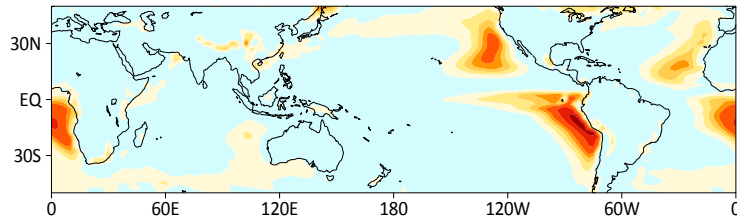
e) 25nup\_1a05b3alph\_halfdiss



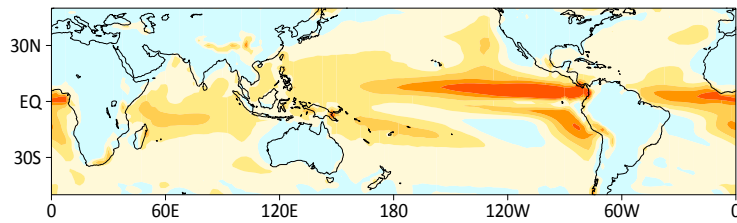
f) 25nup\_1a05b3alph\_nozm



g) 25nup\_1a05b3alph\_aspd-it-1alim



h) 25nup\_2a05b0alph\_nozm



i) 25nup\_2a05b0alph\_as-1alim\_nozm

