

Effect of Physics on Chemistry

(Comparison of 4 deep convective schemes)

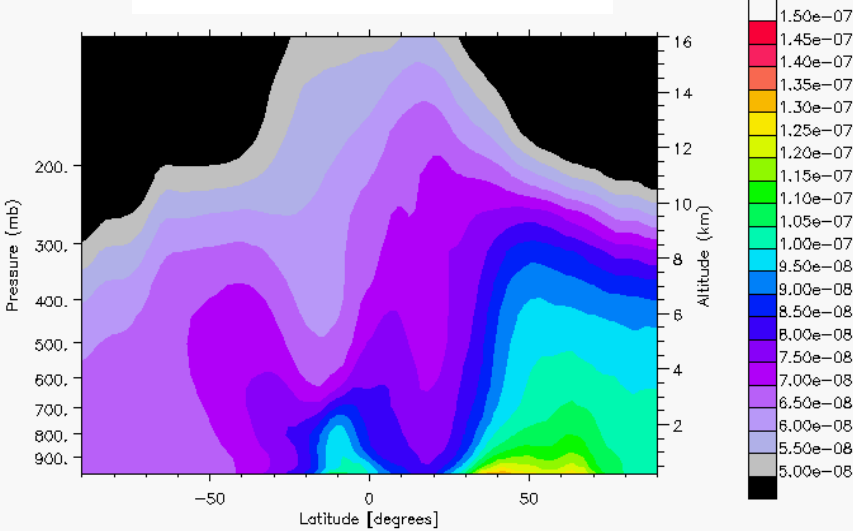
Goal

- Examine sensitivity of chemistry to current/proposed convective parameterizations
 - Use offline-CAM model: feedbacks not allowed
- New parameterizations improve climate simulations considerable.
- Can we use chemistry to constrain parameterizations?

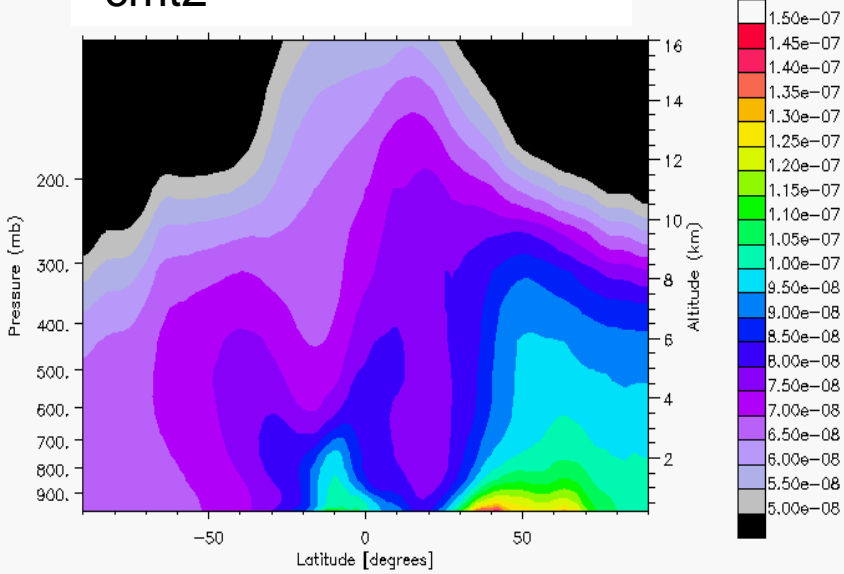
▪

Zonally Averaged JJA CO (50 to 150 ppbv, contour interval of 5 ppbv)

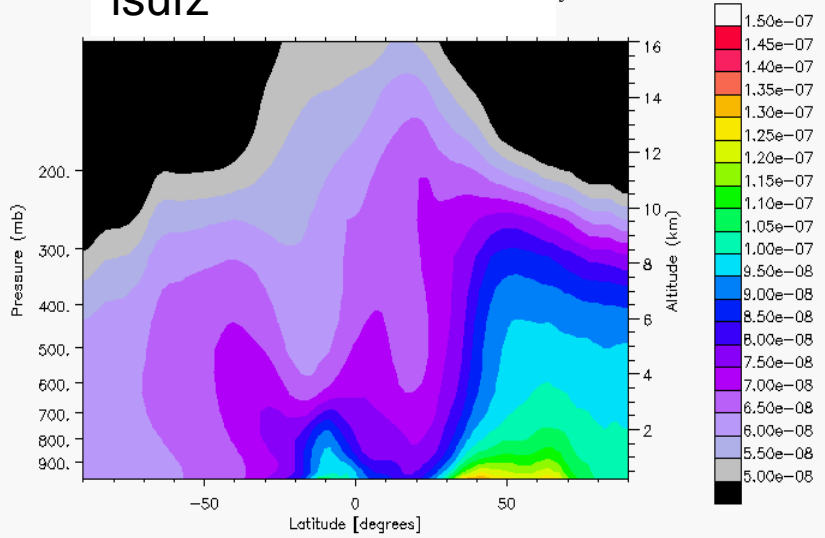
fvz



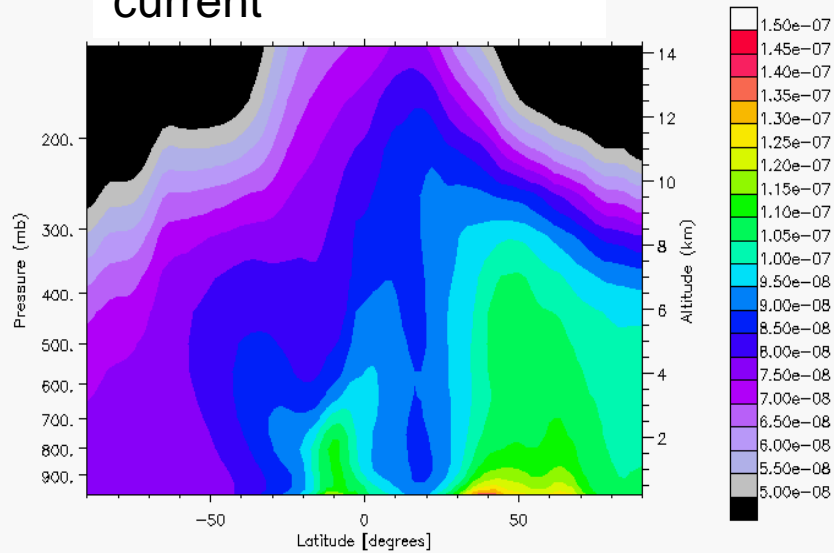
cmt2



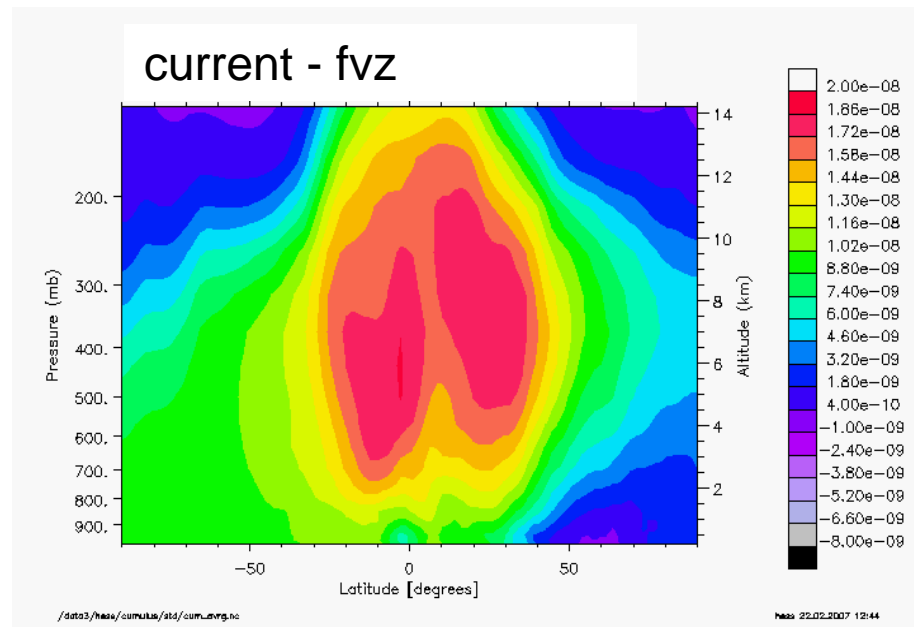
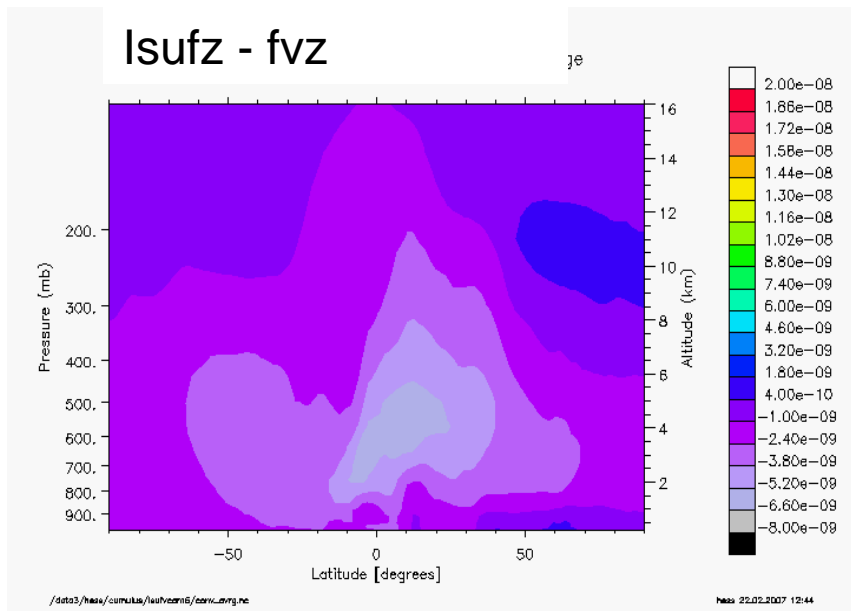
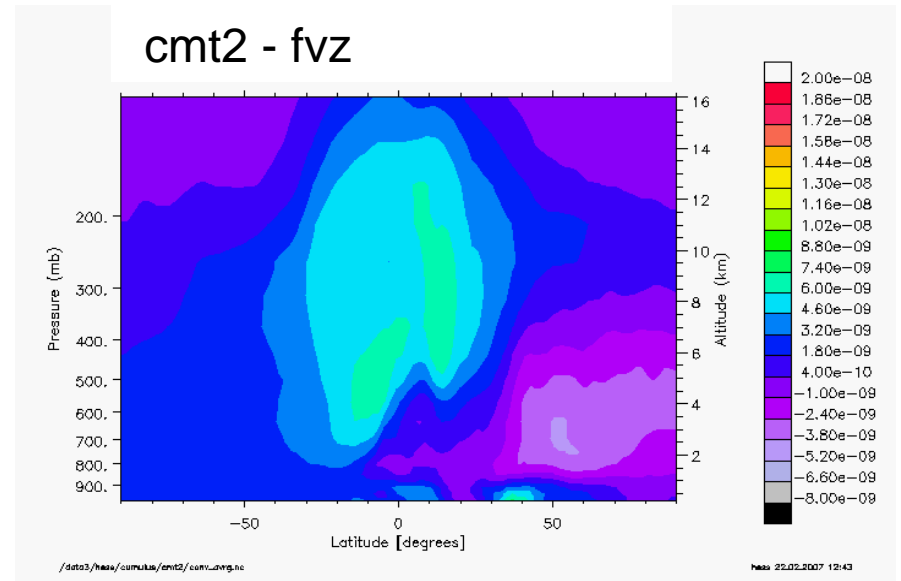
isufz



current

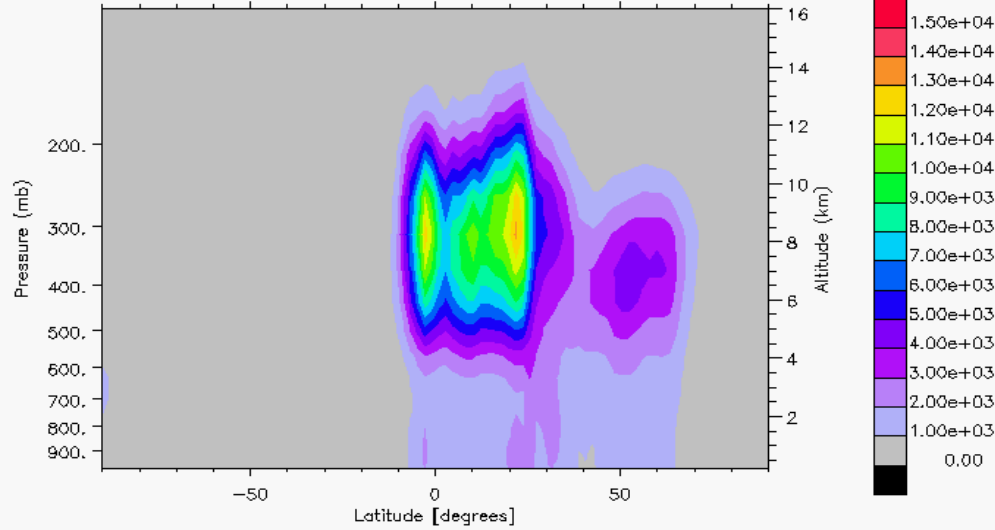


Zonally Averaged JJA CO Differences (-8 to 20 ppbv, contour interval of 1.4 ppbv)

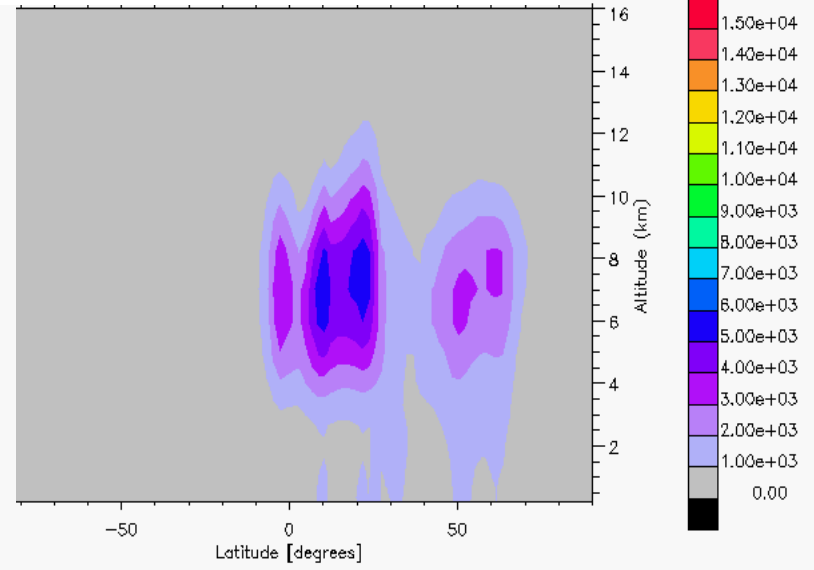


Zonally Averaged Lightning NO (0 to 1.6 E4 molec/cm3/s, contour interval 1 e3)

fvz

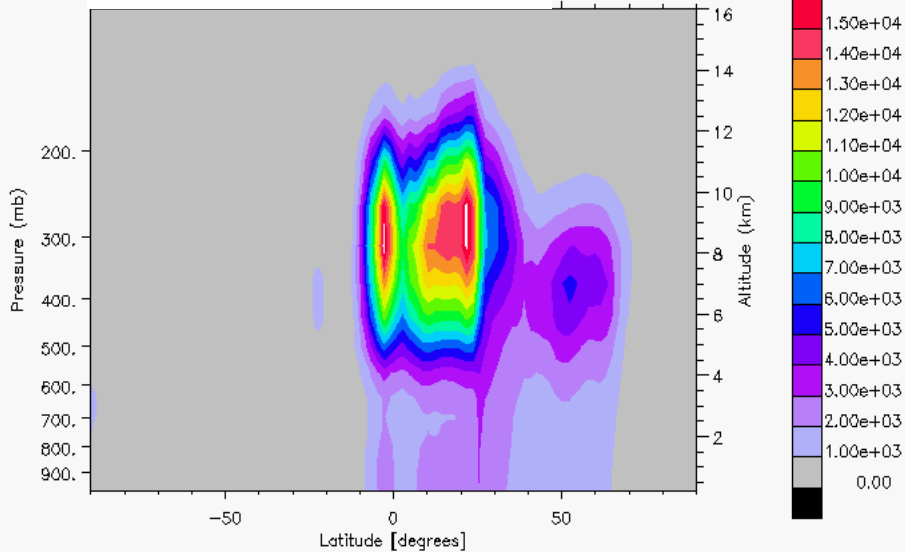


cmt2

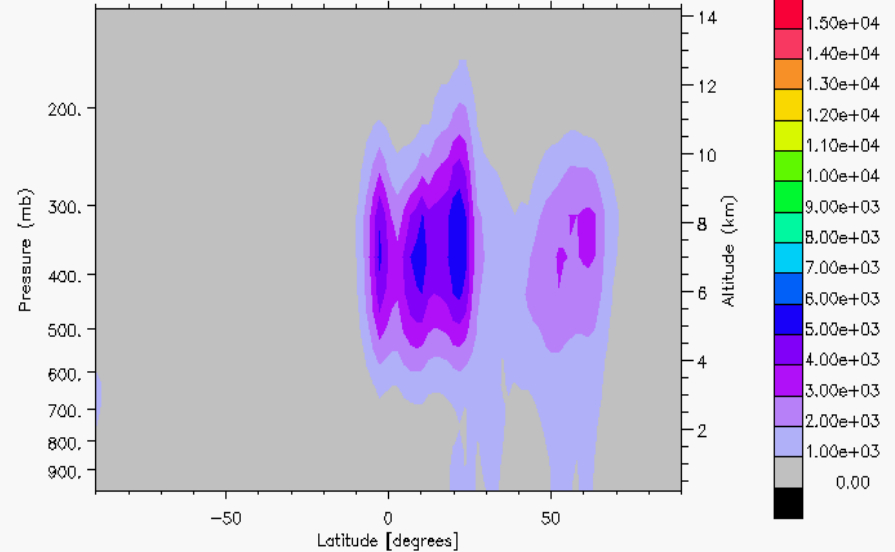


Isufz

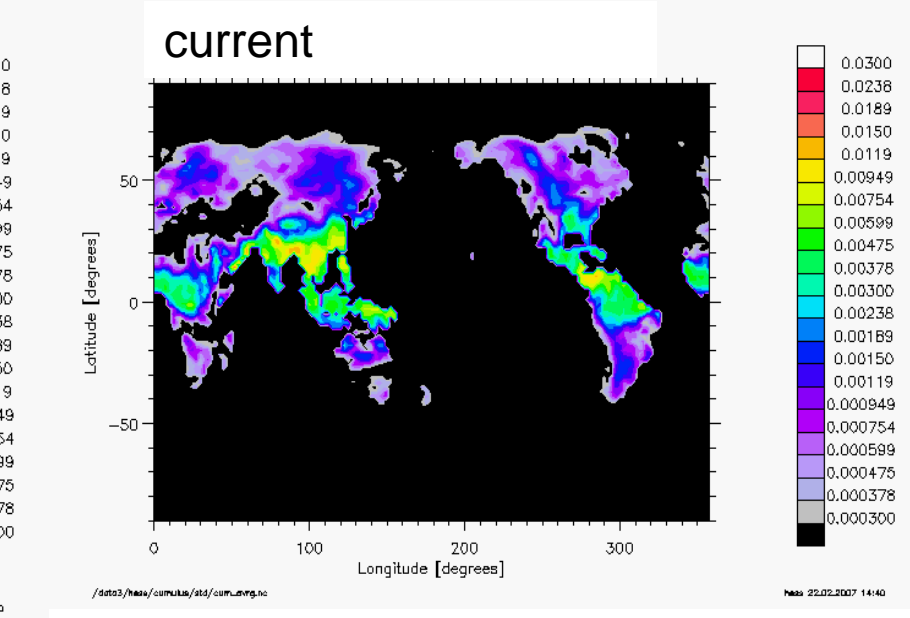
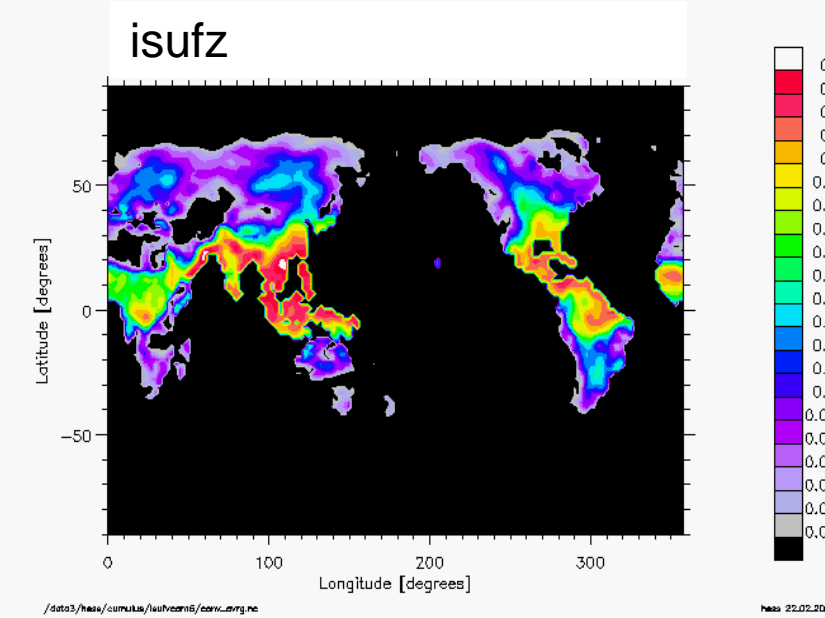
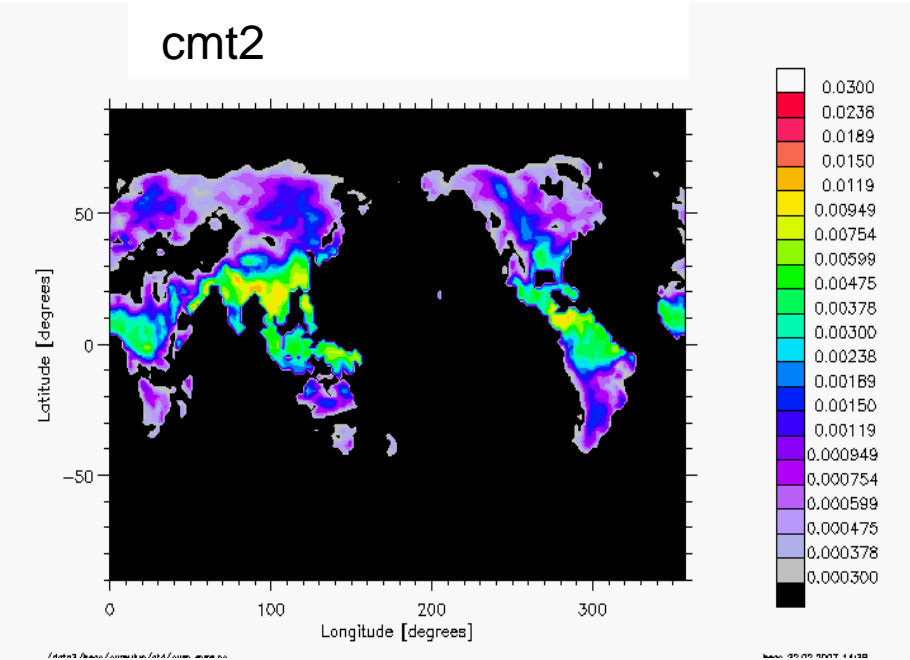
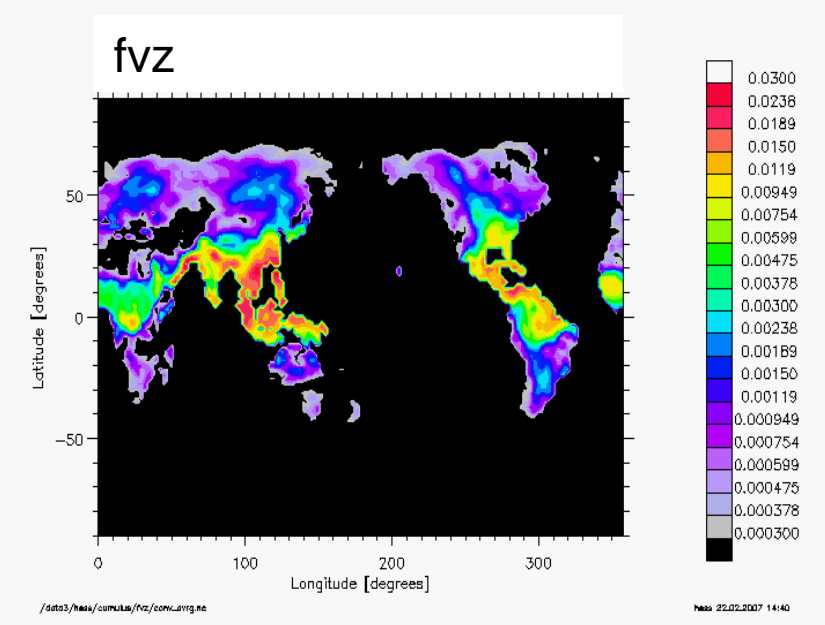
on average



current

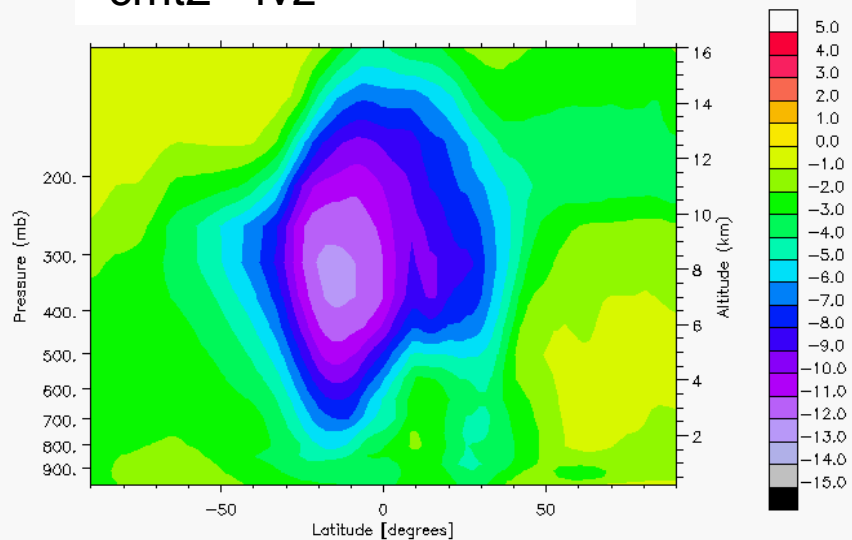


Lightning N JJA (Tg N/year log scale .0003 to .030)



Zonally Averaged JJA O3 Differences (-15 to 5 ppbv, contour interval of 1 ppbv)

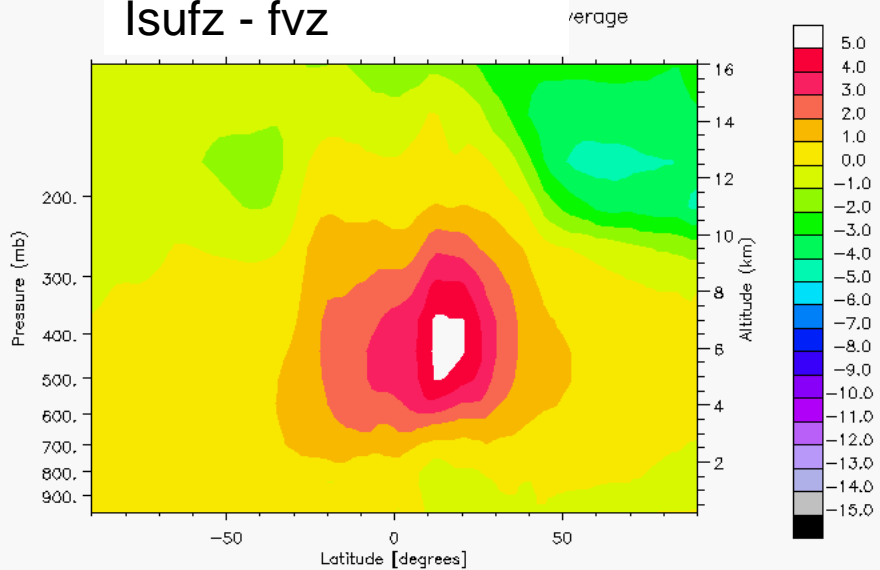
cmt2 - fvz



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haas 22.02.2007 14:11

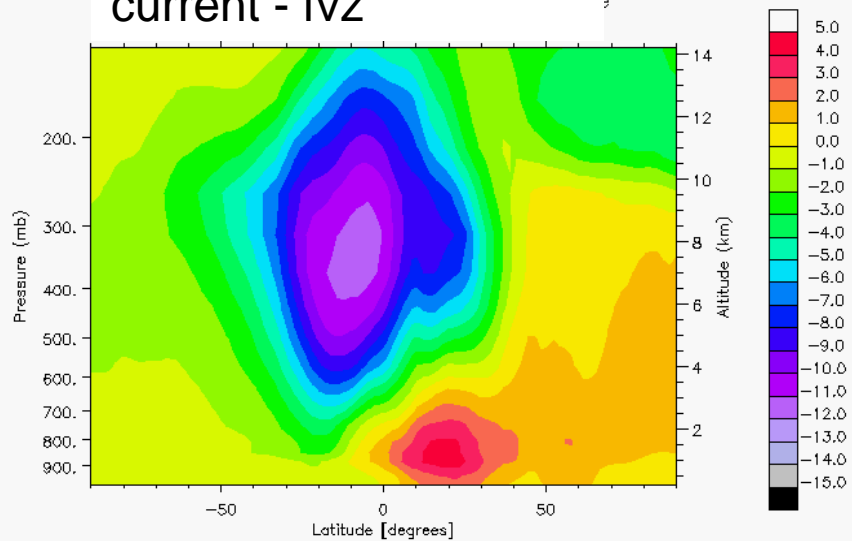
Isufz - fvz



/data3/haas/cumulus/isufz/cum_avg.nc

haas 22.02.2007 14:11

current - fvz



/data3/haas/cumulus/strf/cum_avg.nc

haas 22.02.2007 14:11

Conclusions

- Convective mass flux is not well constrained
- Significant differences in tropics with different schemes in O₃, CO...
- Can we constrain with chemistry?
- More work is needed to understand physics changes on the chemistry