

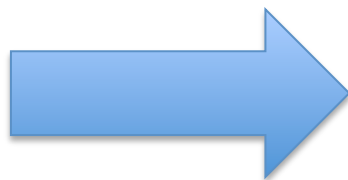
# Chemistry Working Group

## *Co Chairs:*

*Mat Evans*, University of York, NCAS

**-2015: Jingqiu Mao**, GFDL / Princeton

**2015-: Barron Henderson**, University of Florida



Core responsibilities:

**Standard chemistry scheme, integrator, photolysis**

# Where have we been?

## v9-2

- Update to new JPL rate constants
- Inclusion of Methyl Peroxy Nitrate (MPN)
- Adopt the Paulot isoprene scheme as constant
- Update  $\text{RO}_2 + \text{HO}_2$
- Increase  $\text{NO}_3$  uptake by aerosol
- Inhibit  $\text{N}_2\text{O}_5$  uptake by nitrate aerosol
- Updates to  $\text{HO}_2$

## v10.1

- UCX Chemistry
- Update to the photolysis cross sections
- Updates to isoprene chemistry

# Where are we going?

## Ongoing housekeeping

Include JPL/IUPAC recommendations

Bug fixing

## Known updates coming down the line

**Bromine** chemistry updates,

New **iodine** chemistry

These are likely to reduce  
mean  $O_3$  and OH

Updates to isoprene chemistry

Changes to inorganic chemistry  $NO_x/HO_x$  cycles

# Where are we going?

## Longer term issues

### Stratosphere

Include in the standard version?

### Isoprene chemistry

This is still changing!

### FlexChem

This has been a nightmare...

# Comments

## Are we keeping up with other models?

### **Anthropogenic organics**

Hydrocarbons are light ( $C_1$ - $C_3$ / $C_4$ )

No aromatics

### **Biogenic organics**

No terpene / higher chemistry

### **Chlorine**

No chlorine chemistry

### **Isoprene**

Constantly changing

### **Multiphase**

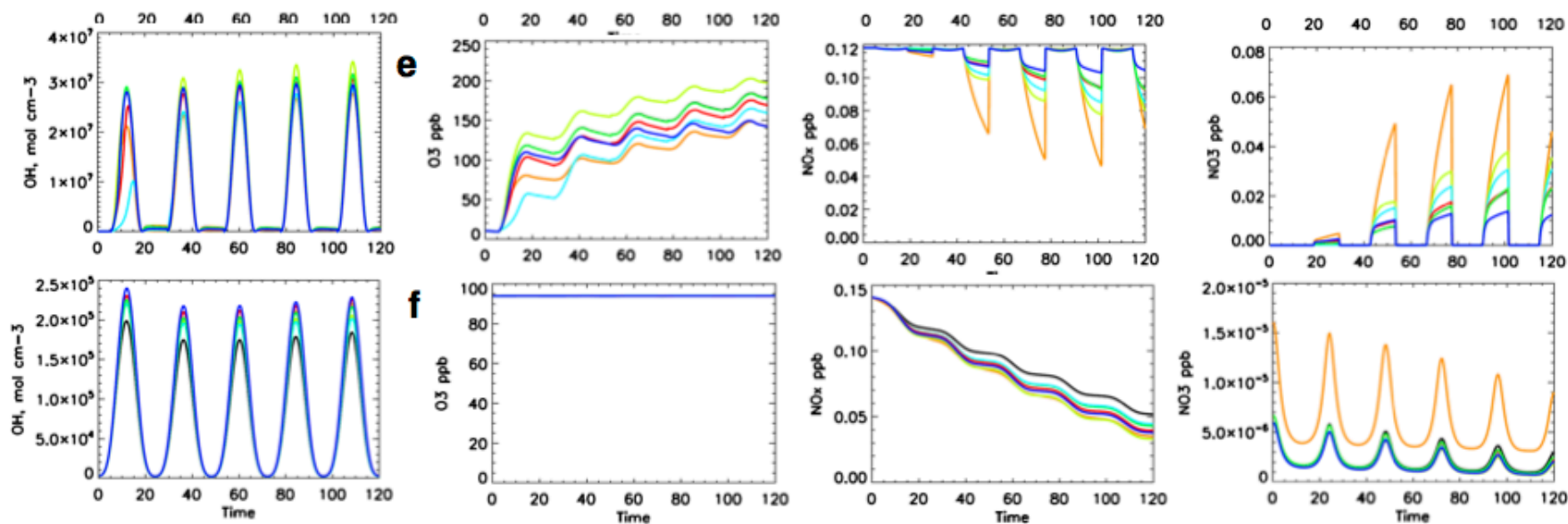
Cloud chemistry (other than  $SO_2$ )

# Comments

Databasing for chemical mechanisms

Automated generation of MCM

Automated comparisons to chemical mechanisms  
against the MCM



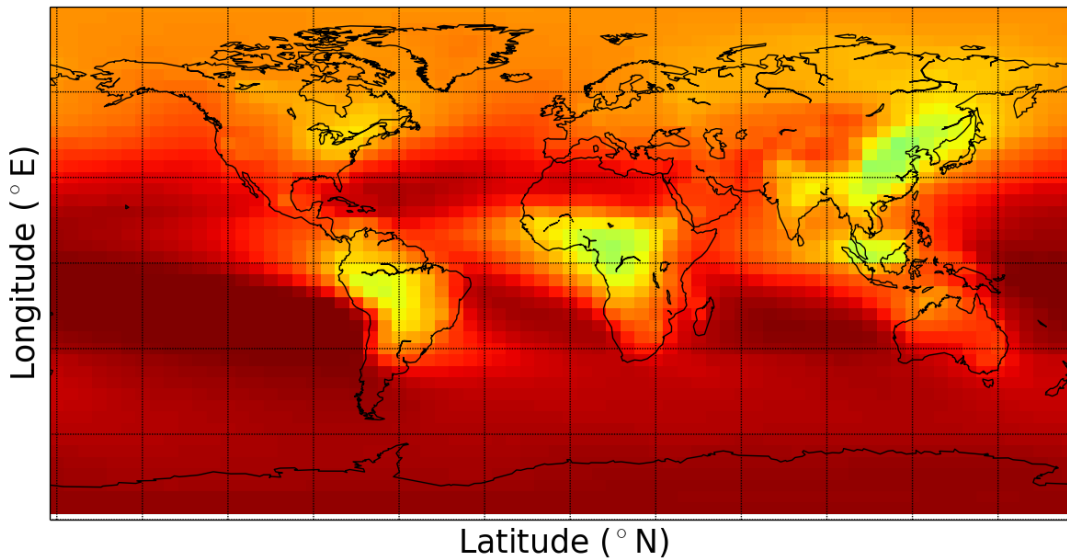
Emmerson and Evans, 2009

2x 3 year PDRAs at University of York. Come ask.....

# Comments

“One persons research topic is another person’s boundary condition....”

The chemistry isn’t “sorted”



Uncertainty in surface [CO] from uncertainty in basic chemical rate constants

See **Ben Newsome's** talk

