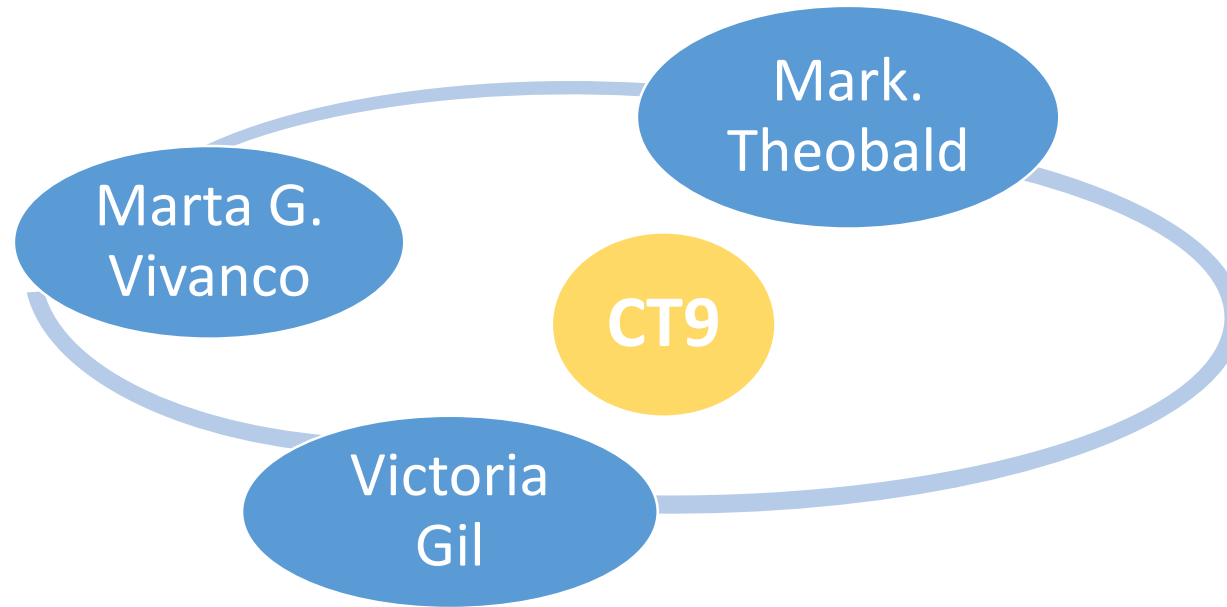


Progress in CIEMAT FAIRMODE- CT9



Unidad de Modelización Atmosférica. Dpto. Medio Ambiente.

CIEMAT



Oslo, 2022

Summary of CIEMAT actions

4 DOM: ~27/ 9/ 3/1 KM

- EMEP emissions
- IFS

1) O3 Episode in

BASE CASE
 NOX REDCUTION 25%
 NOX REDUCTION 50%
 VOC REDUCTION 25%
 VOC REDUCTION 50%
 NOX&VOC REDUCTION 25%
 NOX&VOC REDUCTION 50%^o

Madrid

2MECH

- MELCHIOR
- SAPRC07

1-5 July

Paris

1MECH

- MELCHIOR

5-6 June

Athens

2MECH

- MELCHIOR
- SAPRC07

6-14 August

“Absolute Potential”

2) Pm Episodes

Madrid

Paris

Scenario concentration – Base case concentration

% (Emission Reduction)

CHIMERE

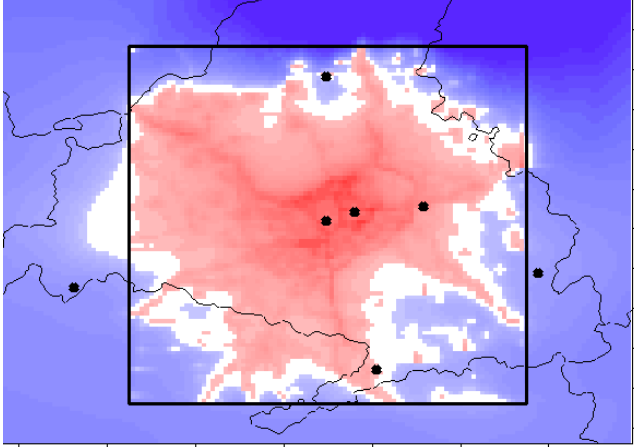
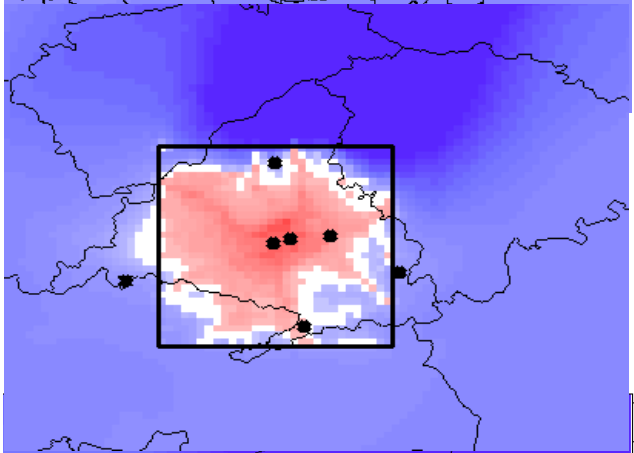
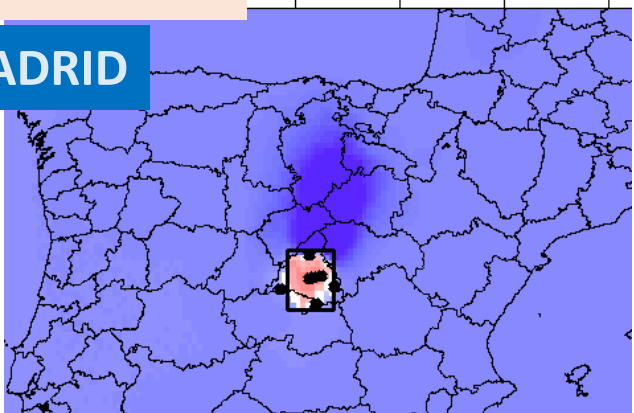
Nox&VOCS 50% reduction

4 DOM: ~27/ 9/ 3/1 KM

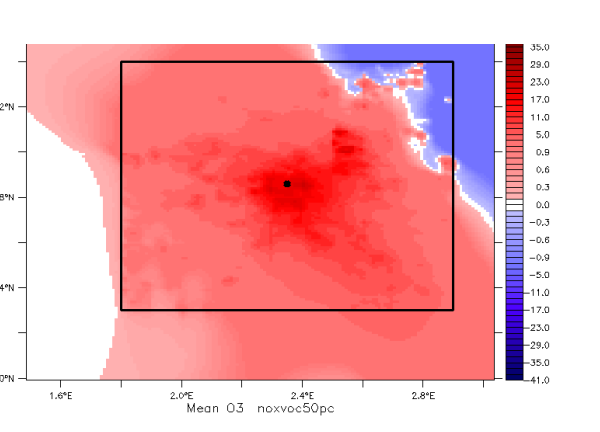
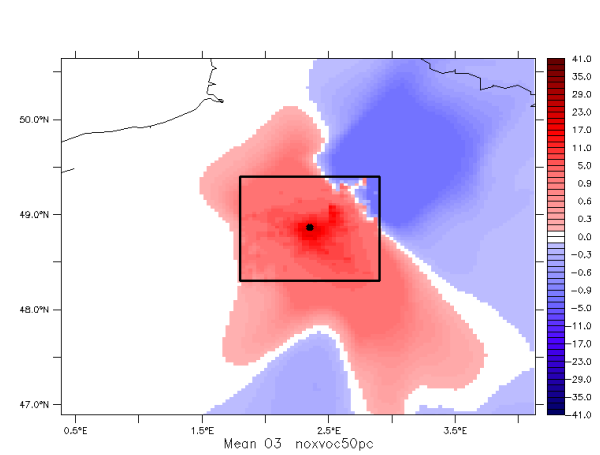
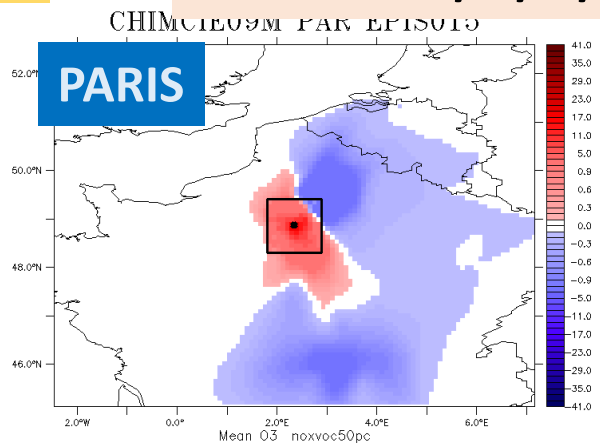
1MECH

- MELCHIOR

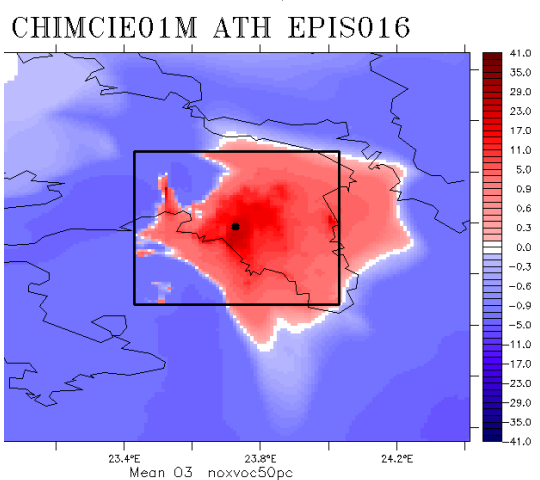
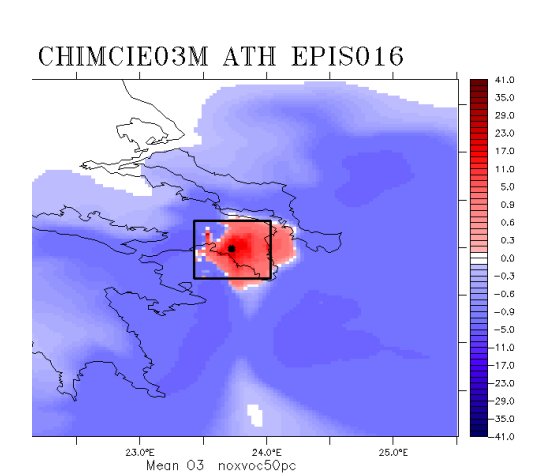
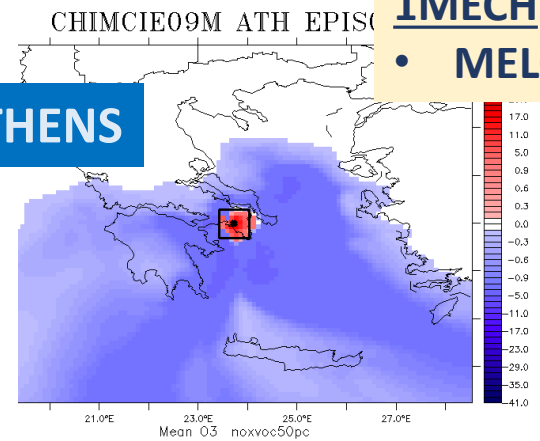
MADRID



PARIS

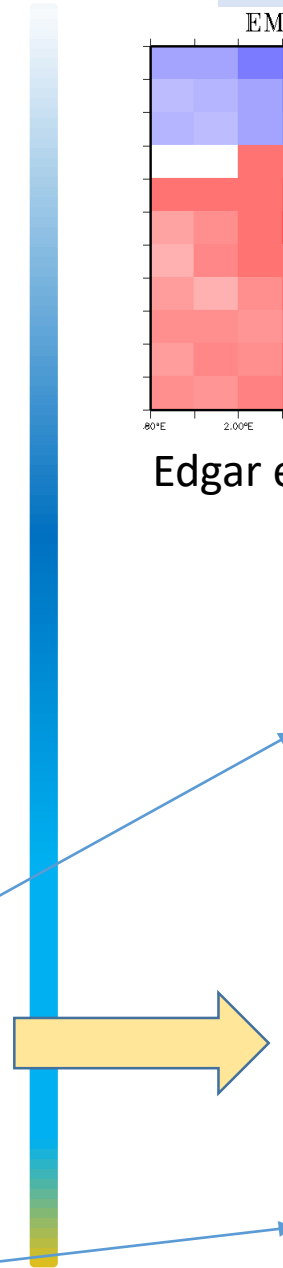
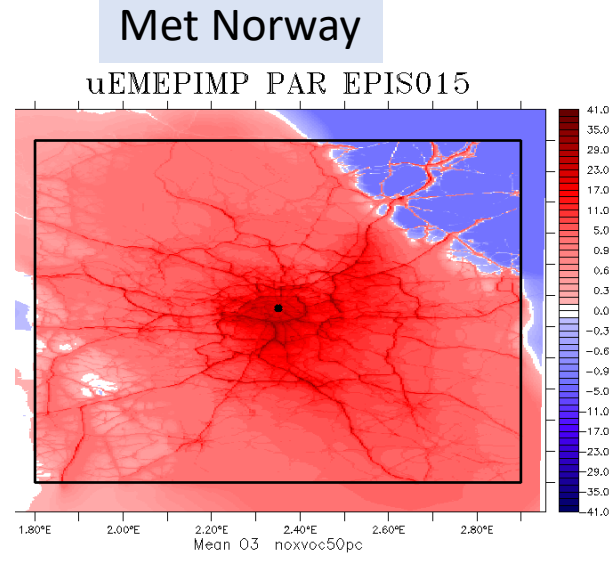
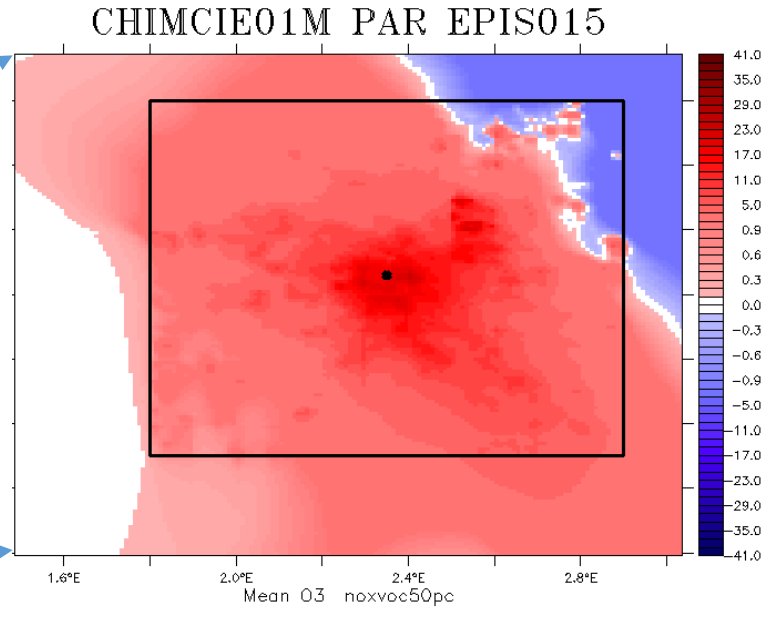
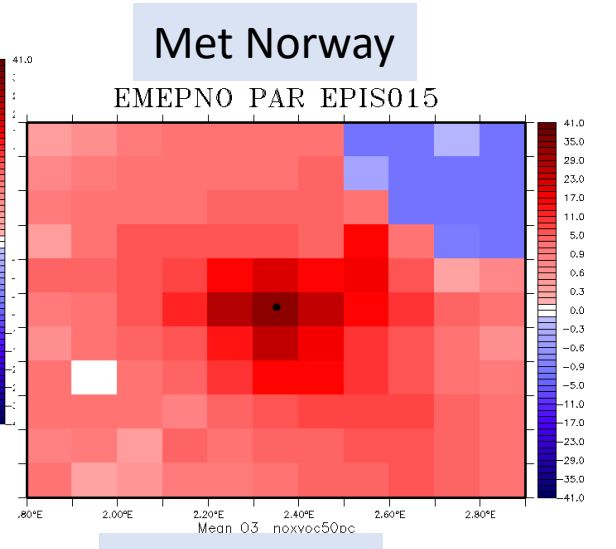
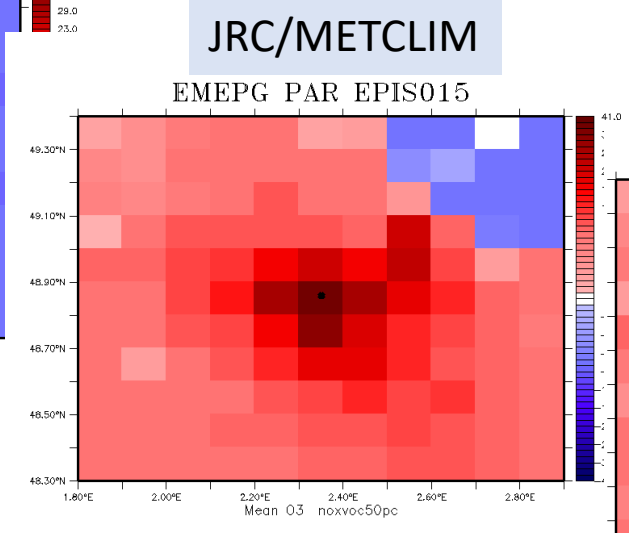
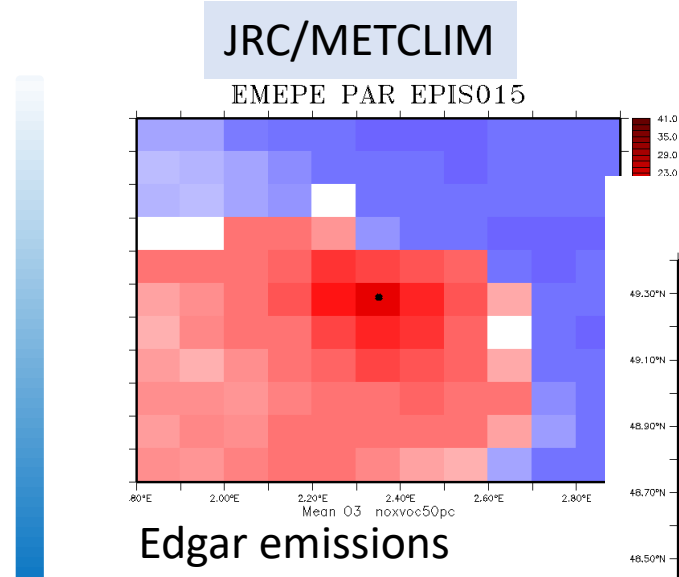
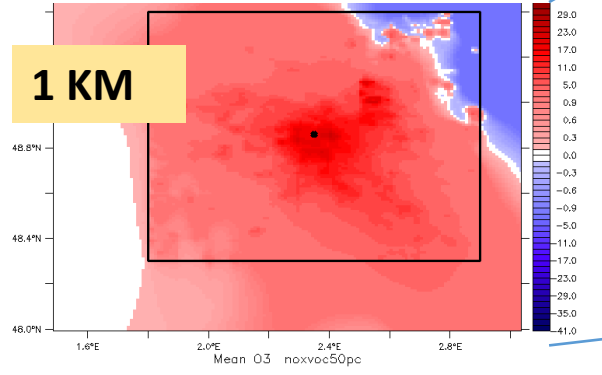
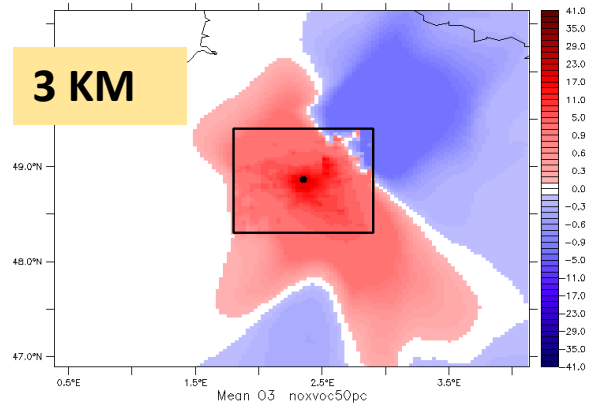
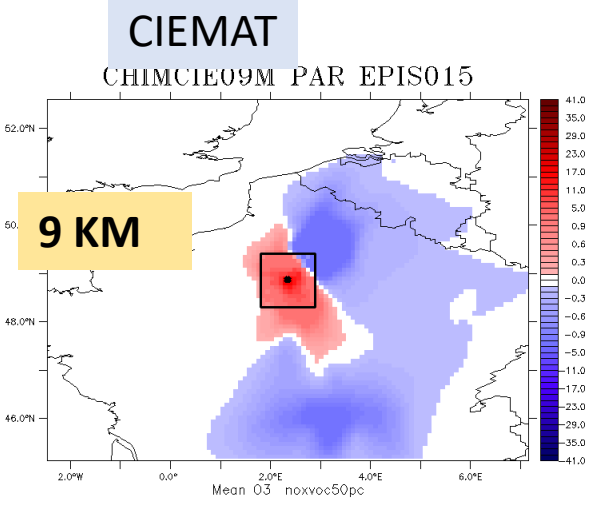


ATHENS



Nox&VOCS 50% reduction

IFS all the models



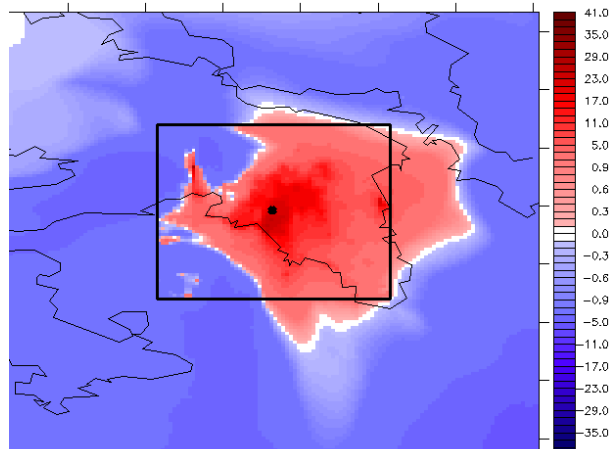
ATHENS

CHIMERE

Nox&VOCS 50% reduction

MELCHIOR

CHIMCIE01M ATH EPIS016

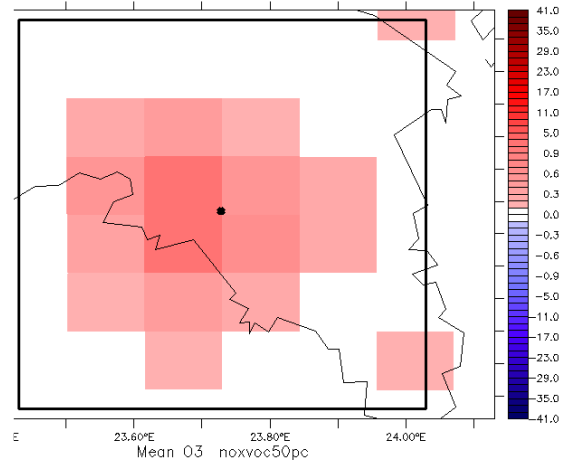


CYI

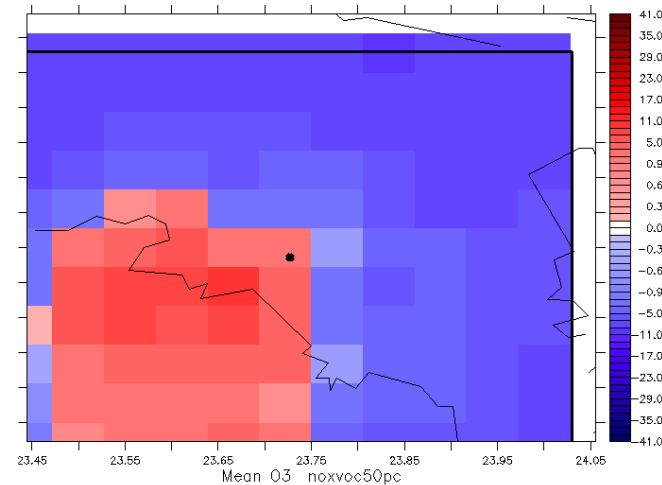
WRF-CHEM

NKUA

WRFCYI ATH EPIS016

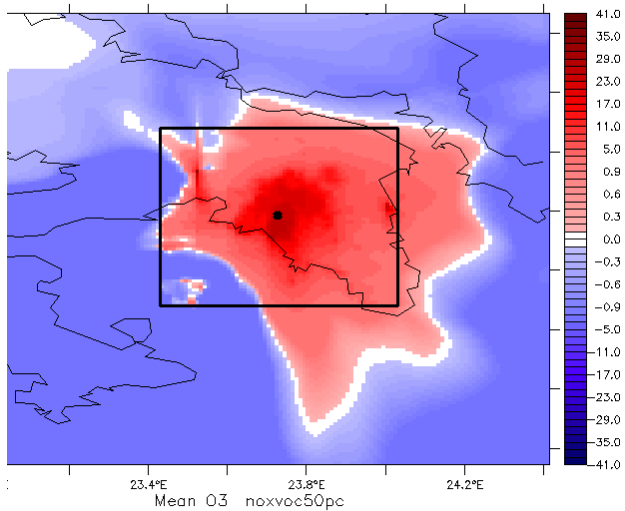


WRFNKUA6 ATH EPIS016



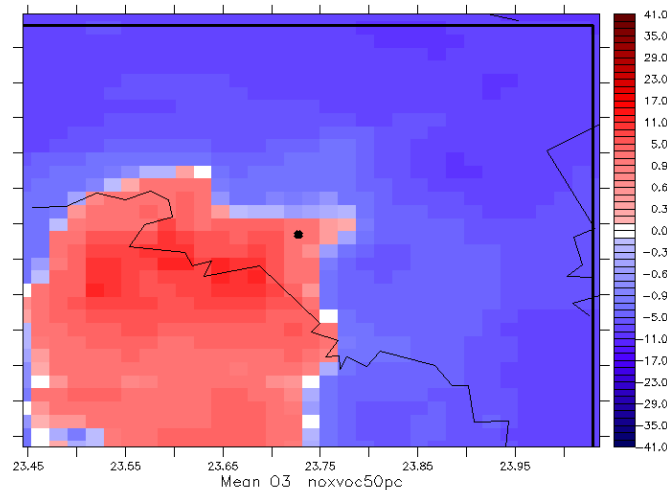
SAPRC07

CHIMCIE01S ATH EPIS016



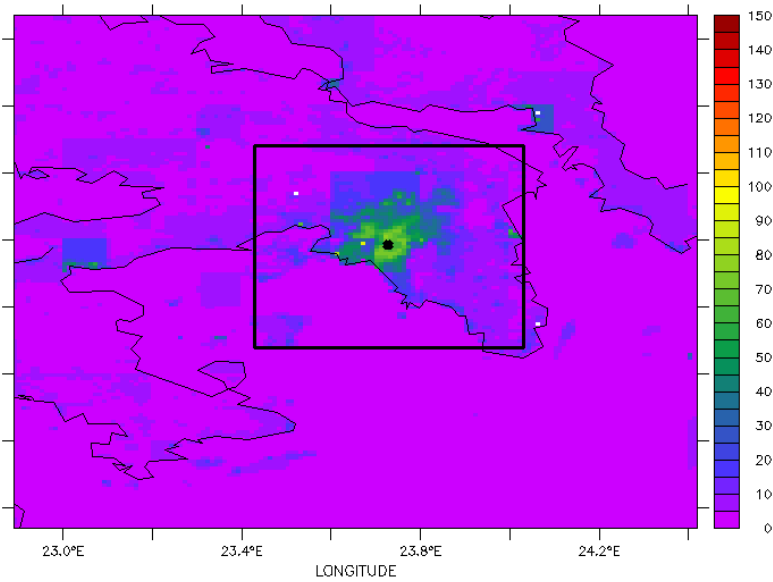
emis: EDGAR v5

WRFNKUA2 ATH EPIS016

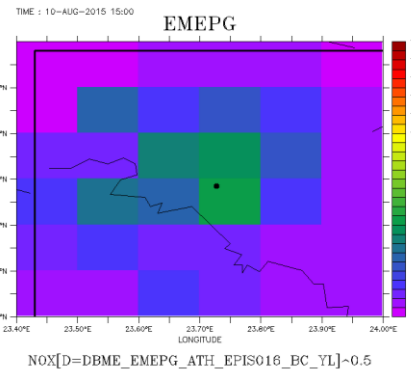


emis: EDGAR

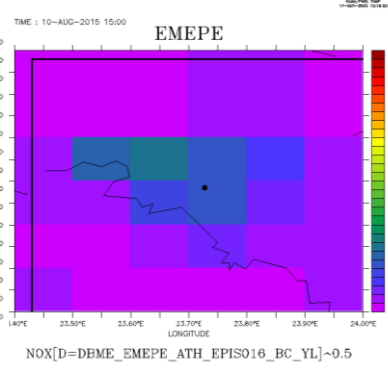
CHIMCIE01M



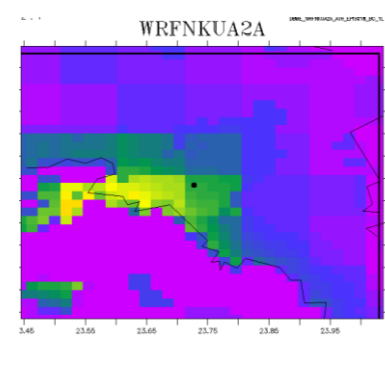
NOx



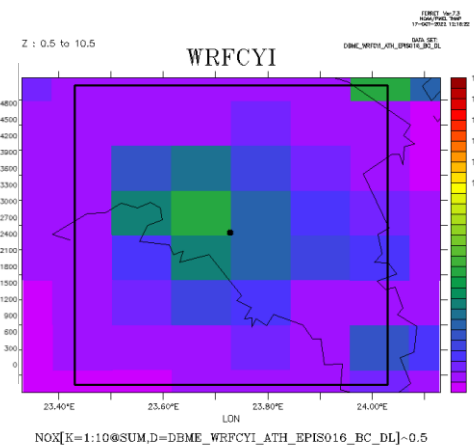
EMEP G



EMEP E



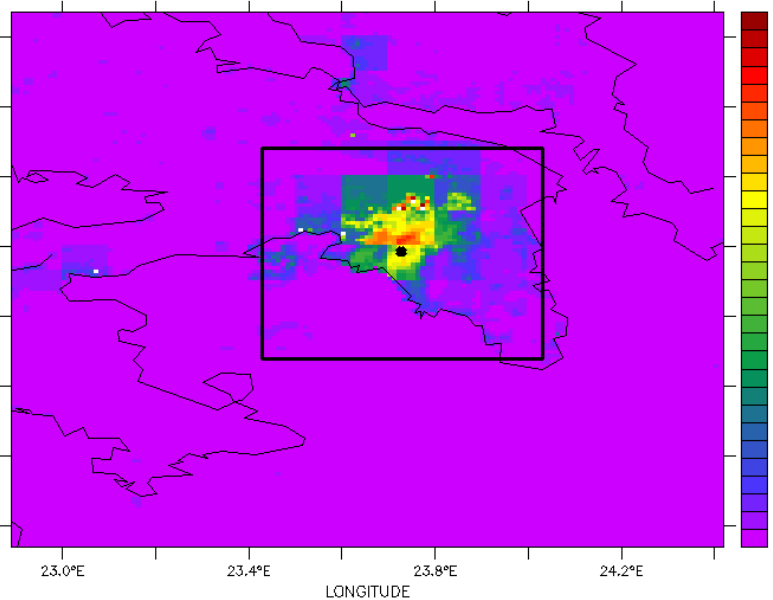
WRFNKUA2



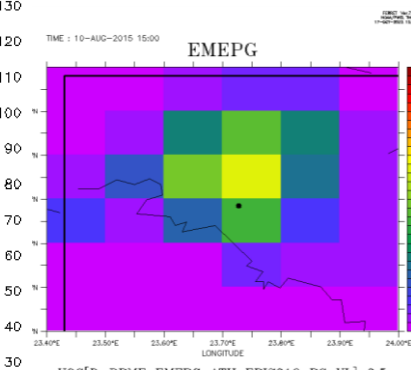
WRFCYI

T : 1

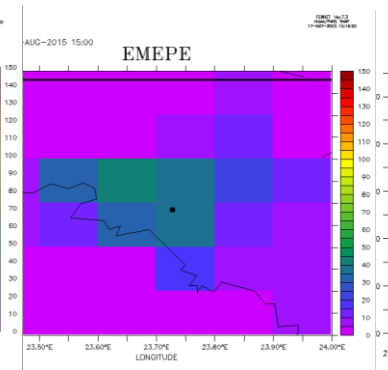
CHIMCIE01M



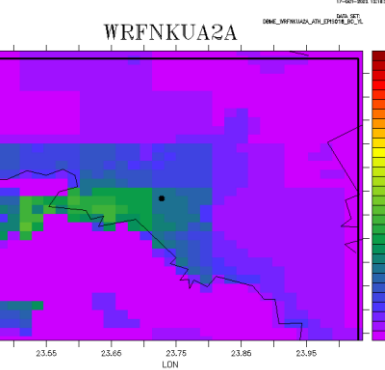
VOC



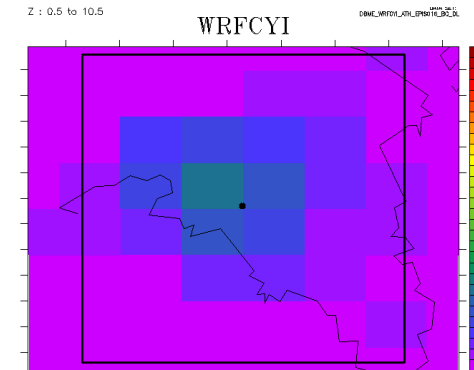
EMEP G



EMEP E



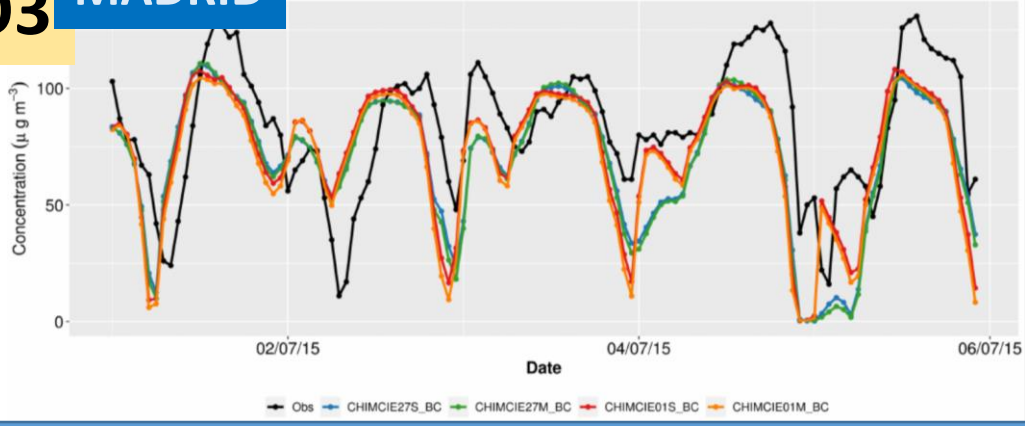
WRFNKUA2



WRFCYI

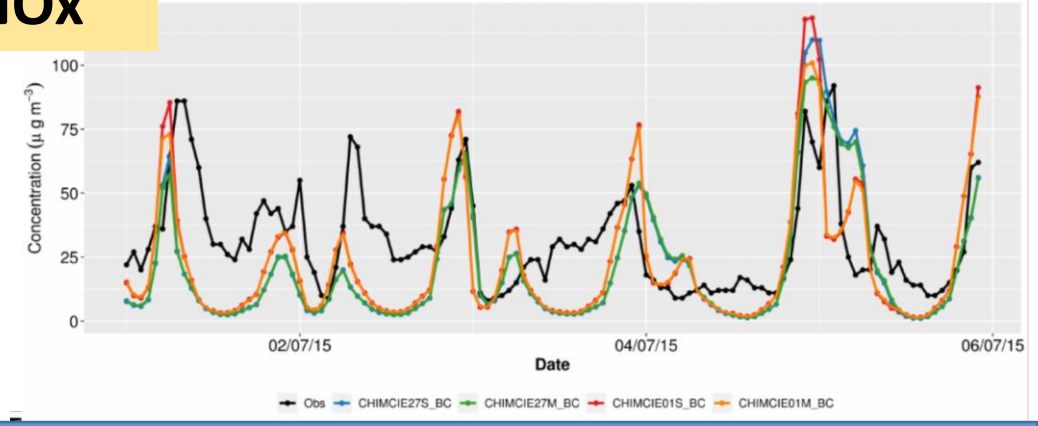
03 MADRID

ES0124A : ARTURO SORIA (background urban)



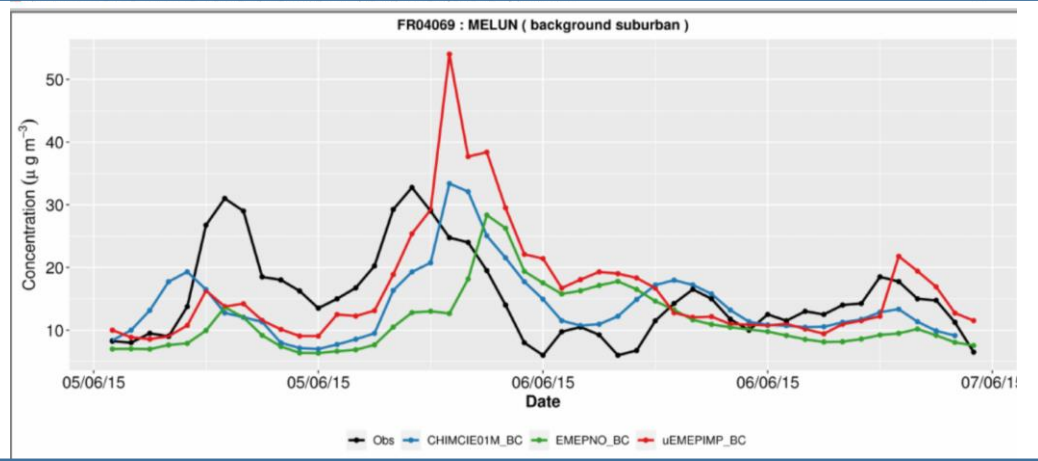
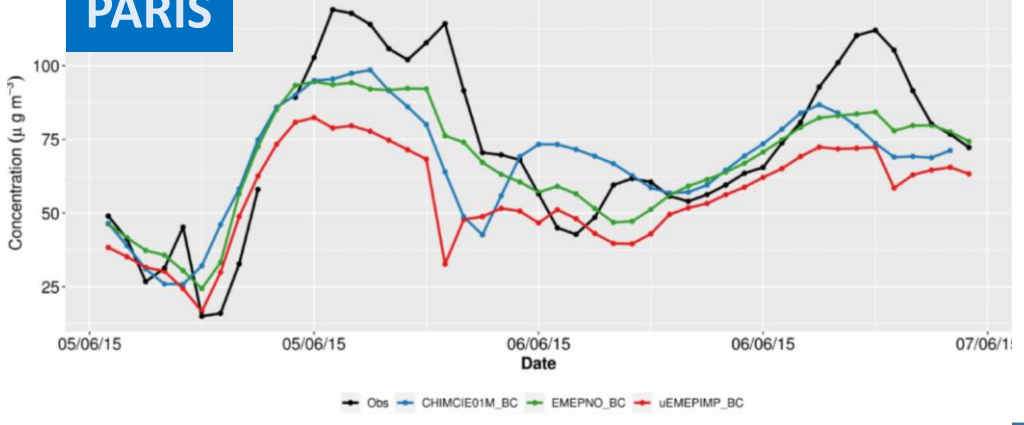
NOx

ES0124A : ARTURO SORIA (background urban)



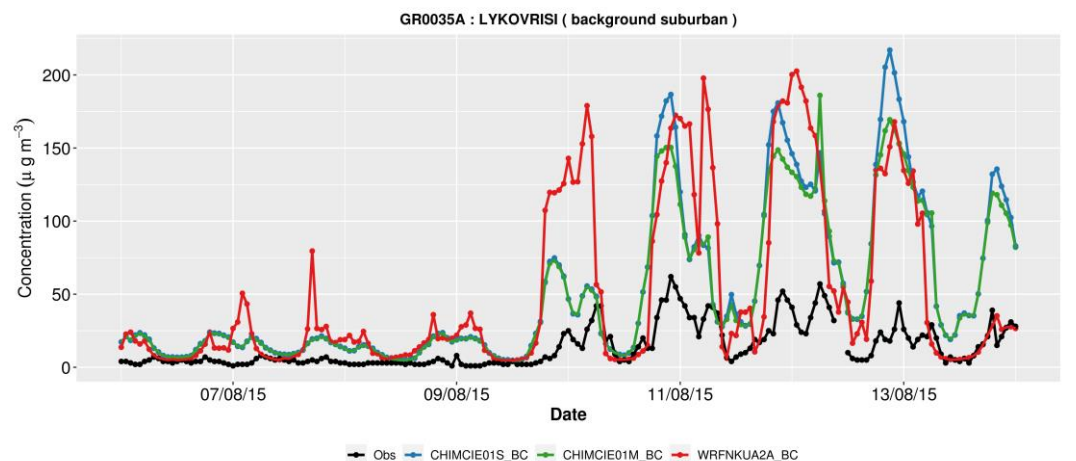
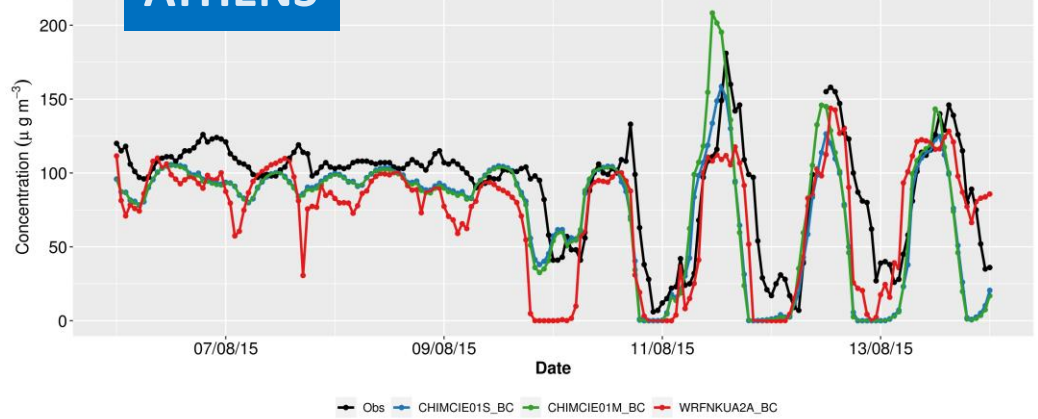
PARIS

FR04069 : MELUN (background suburban)



ATHENS

GR0035A : LYKOVRSI (background suburban)



Differences between 3 and 1km2 horizontal resolution are more pronounced for p95

Nox&VOCS 50% reduction

Absolute Potential

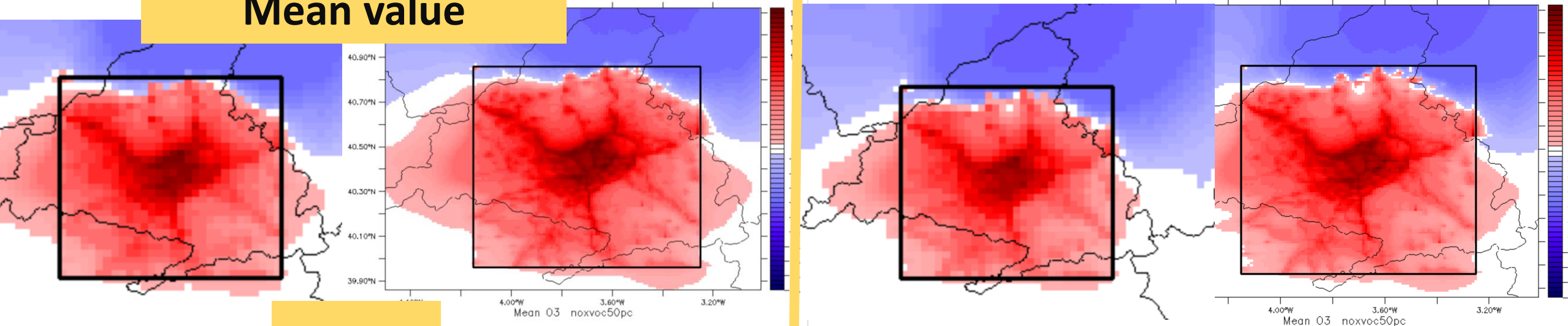
MELCHIOR 3 km

MELCHIOR 1 km

SAPRC07 3 km

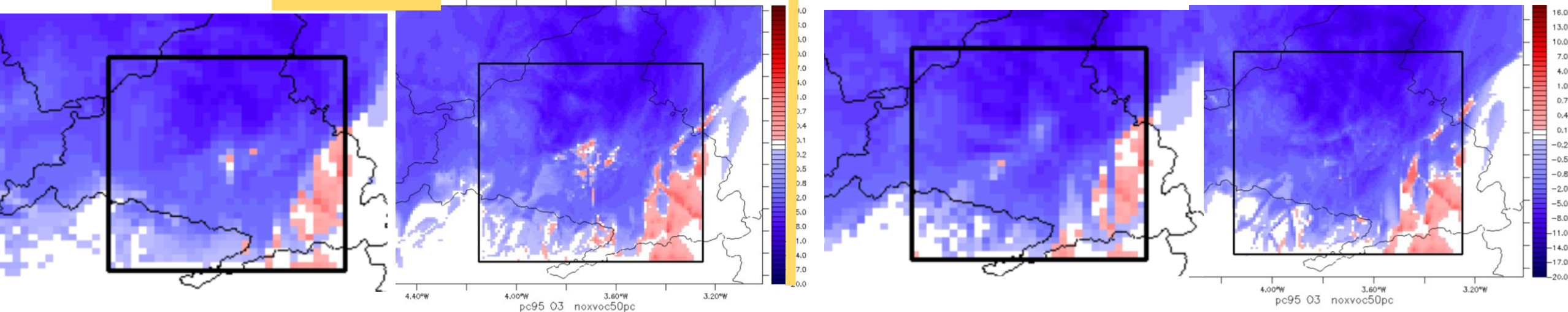
SAPRC07 1 km

Mean value



p95

MELCH 1km

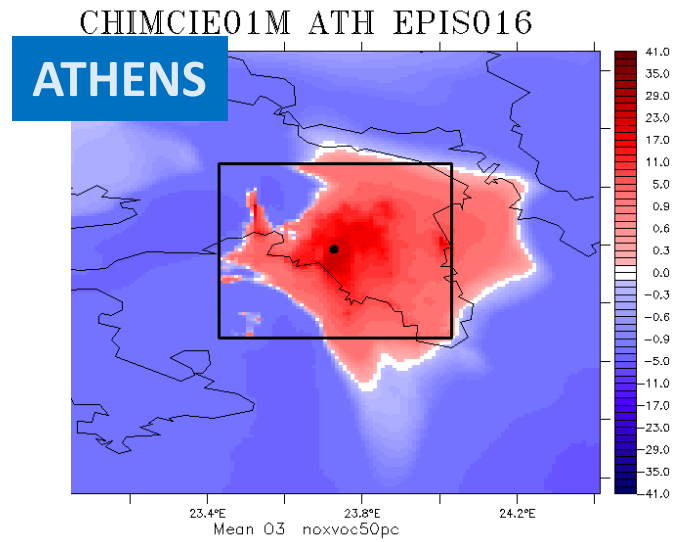
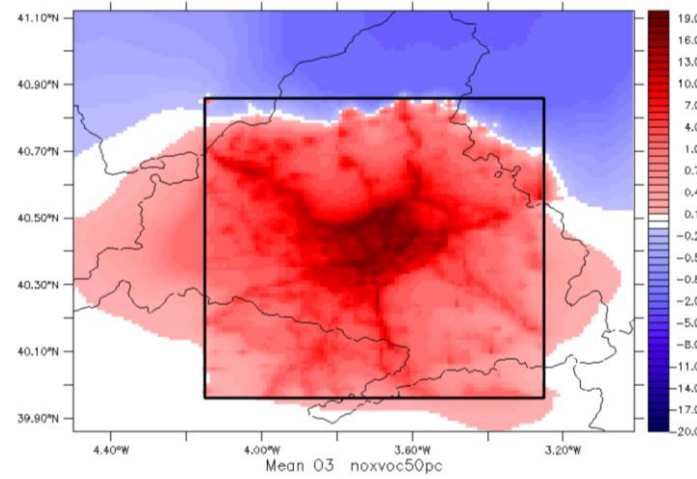


CHIMERE

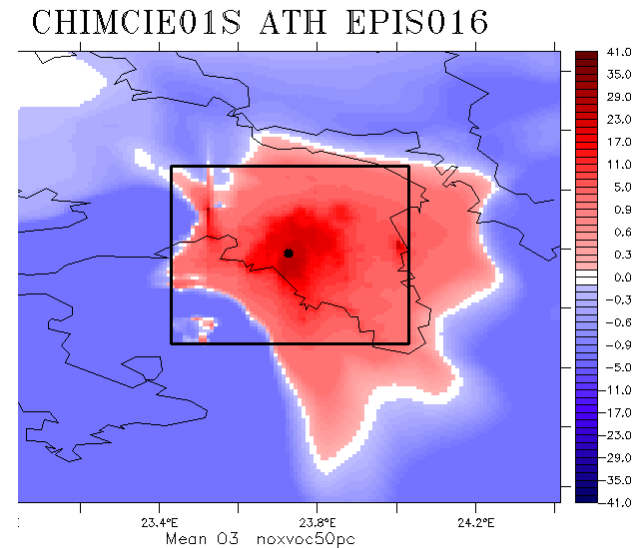
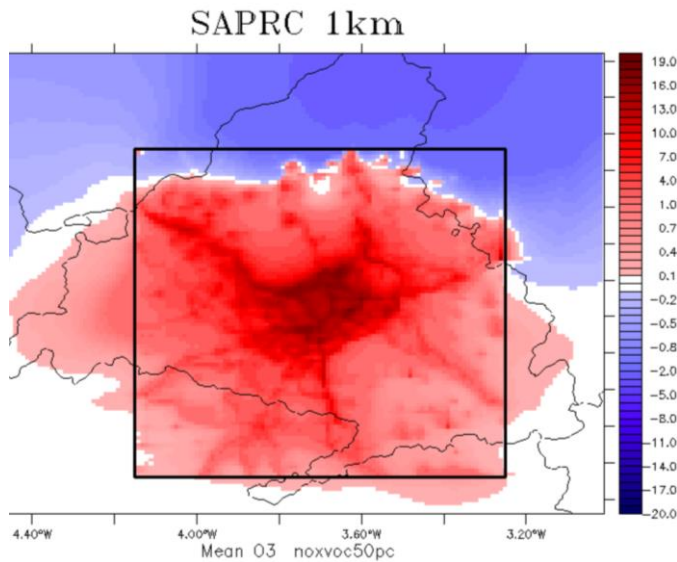
Nox&VOCS 50% reduction

Absolute Potential (from mean values)

MADRID



MELCHIOR



SAPRC07

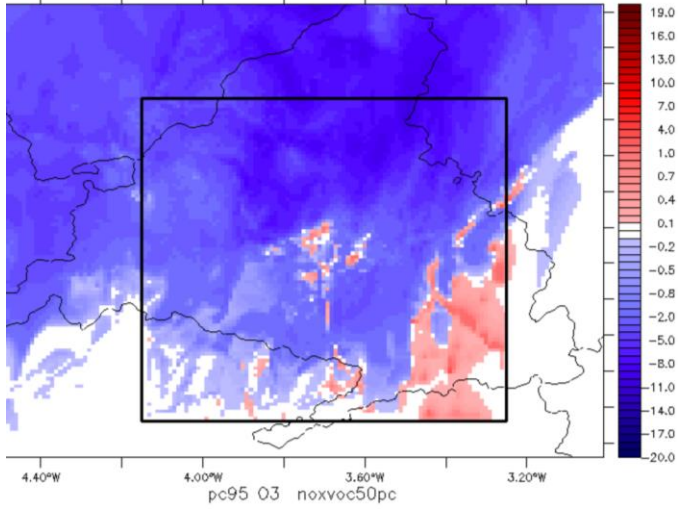
CHIMERE

Nox&VOCS 50% reduction

Absolute Potential (from p95 values)

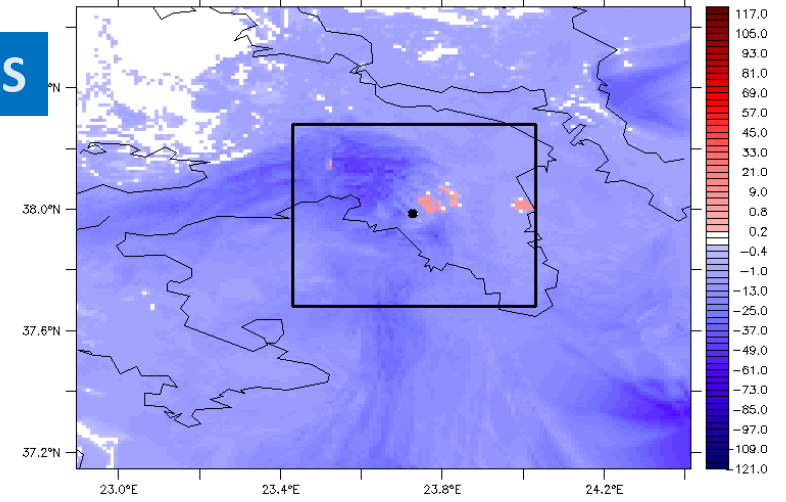
MADRID

MELCH 1km



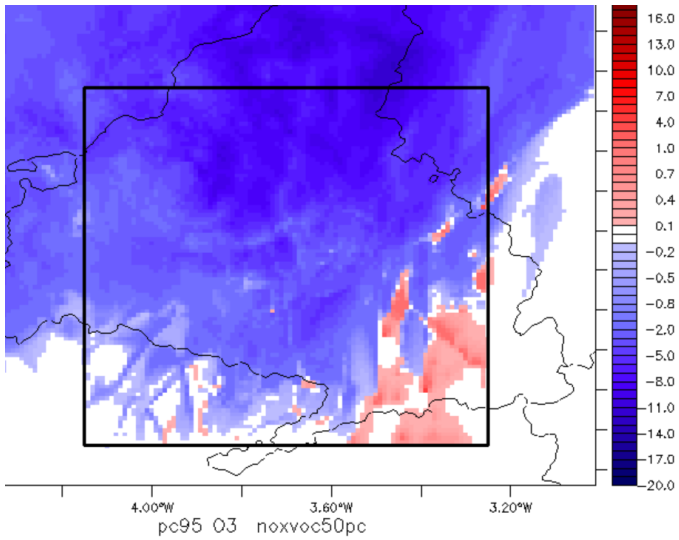
ATHENS

CHIMCIE01M ATH EPIS016

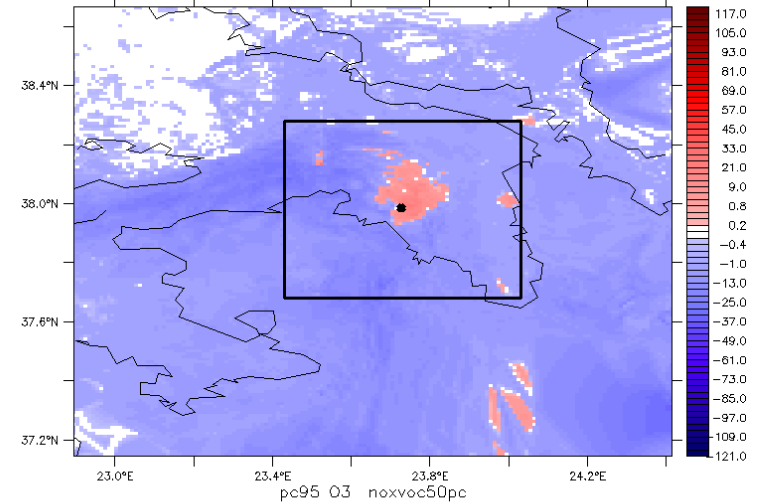


MELCHIOR

SAPRC07



CHIMCIE01S ATH EPIS016



Much more material and analysis done (but here only some slides)

- CHIMERE with WRF in Athens? Why these high NO_x? (emissions, meteo?)
- More models in Madrid (hourly)?
- When can we trust models? (taking into account model performance...)

Thank you

- Interesting applying at 1km CHIMERE in other cities
- Also interesting: comparing to other models at this scale
- Comparing 2 mechanisms in CHIMERE: in line with on-going studies in CIEMAT
- Analysing NO_x&VOC emis → O₃ : in line with last years studies in CIEMAT