Planning indicators and benchmarking
WG4

Application on Portugal

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The purpose

Main goal
Development a common benchmarking methodology in order to test the accuracy of air quality models when used to simulate the effect of emission reduction strategies.

Benchmarking indicators has been presented last meeting!

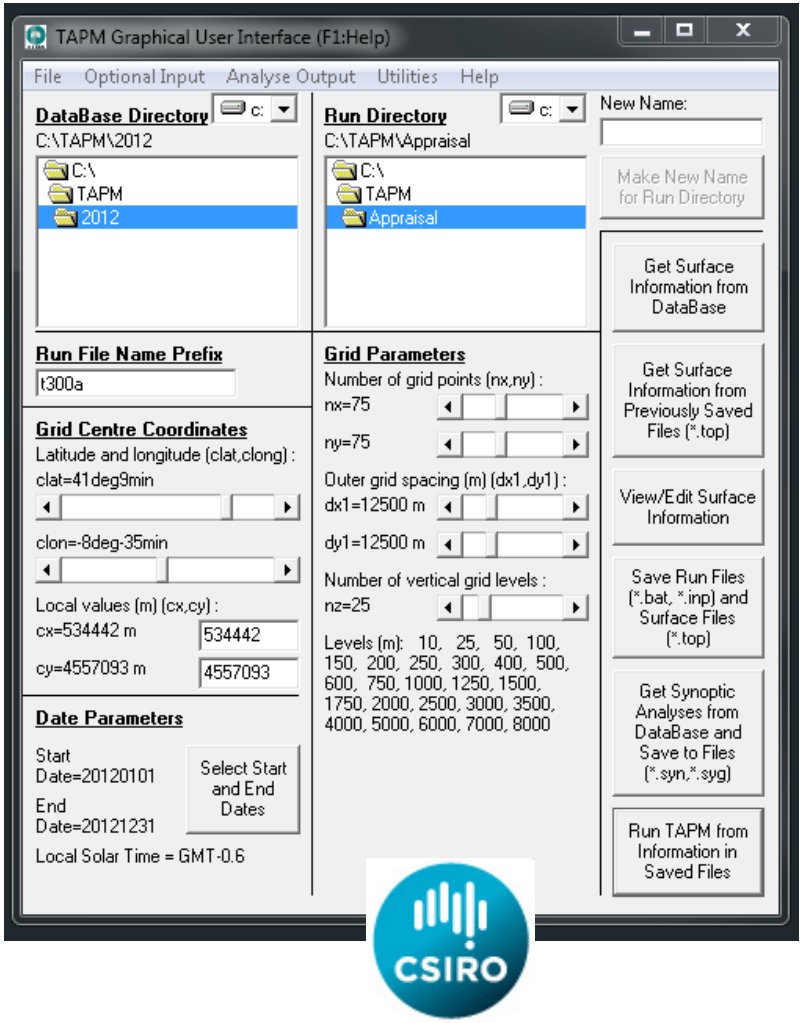
Exercise
participants who could perform a series (minimum 3) of emission reduction scenario over an area of their choice (country, region or city) over a given time period.

The air quality model

The Air Pollution Model (TAPM)
developed by CSIRO (Australian National Agency)
friendly graphical interface
suitable for long-term simulations

Model used to simulate the transport and dispersion of atmospheric pollutants
Both local and regional scale.
Wet and dry deposition of pollutants
Point sources emissions
Line source emissions
Area/volume source emissions

www.csiro.au/Outcomes/Environment/Population-Sustainability/TAPM.aspx

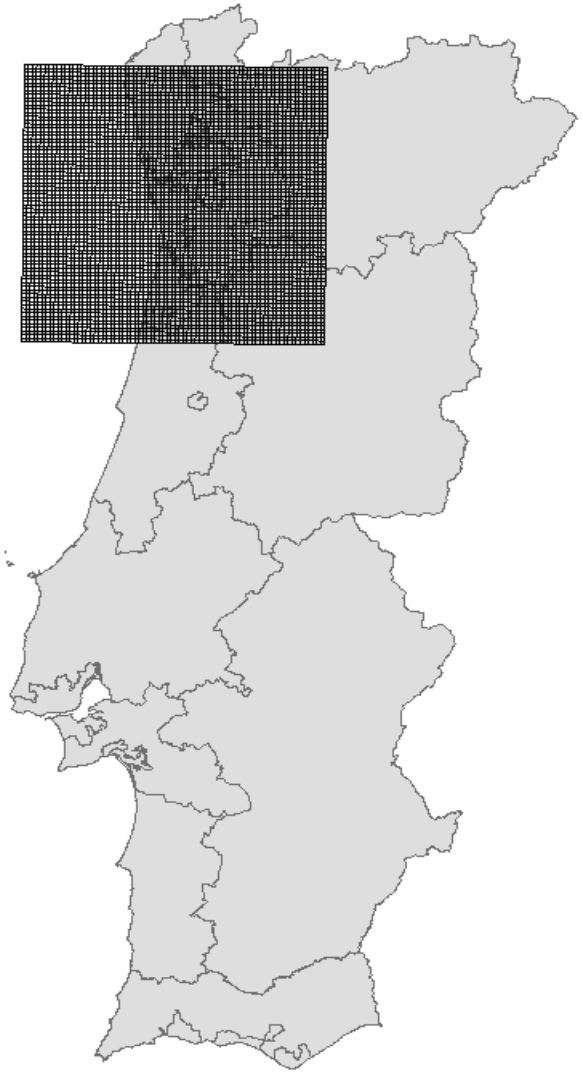


Model setup

Domain:
Northern Region of Portugal

Resolution:
2 km 2 km
75 75 cells

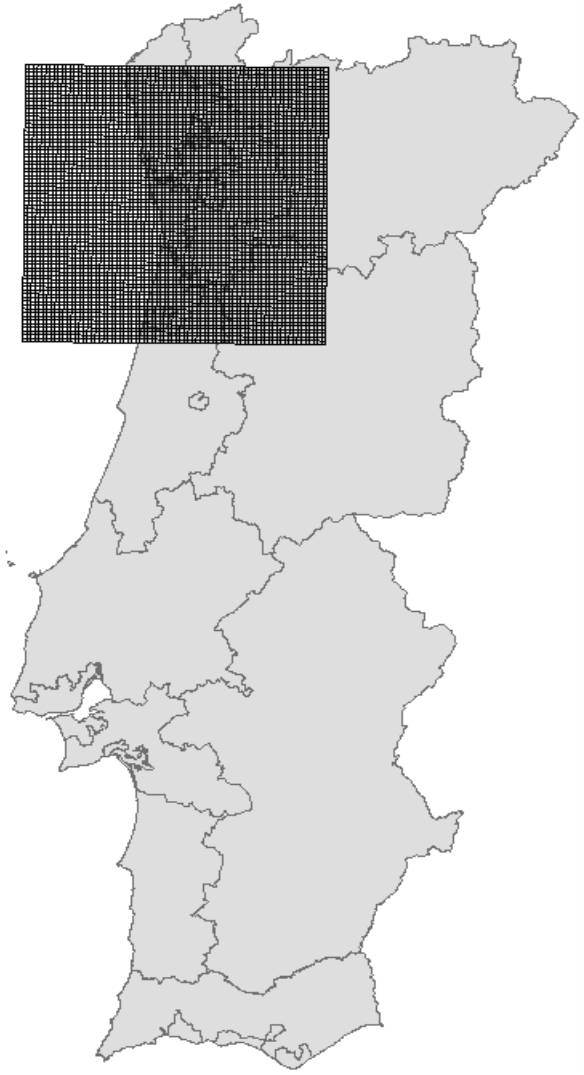
Time period:
2012 year



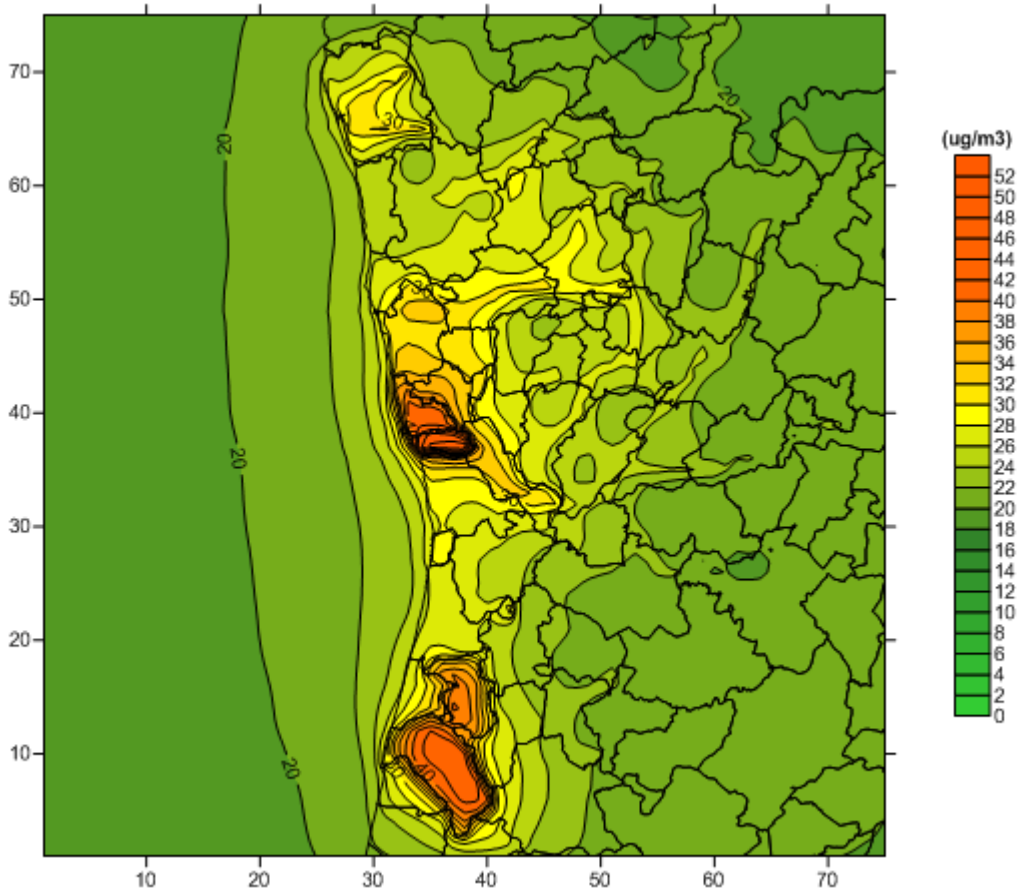
Scenarios simulated

SCEN00	Base case	2012 year
SCEN01	Emissions NO_X	- 20%
SCEN02	Emissions SO_X	- 20%
SCEN03	Emissions NH_3	No Simulated*
SCEN04	Emissions PPM	- 20% of PM10 and PM2.5
SCEN05	Emissions VOC	- 20%
SCEN06	All Emissions	- 20%
SCEN07	Emissions NO_X	- 50%
SCEN08	Emissions SO_X	- 50%
SCEN09	Emissions NH_3	No Simulated*
SCEN10	Emissions PPM	- 50%
SCEN11	Emissions VOC	- 50%
SCEN12	All Emissions	- 50%

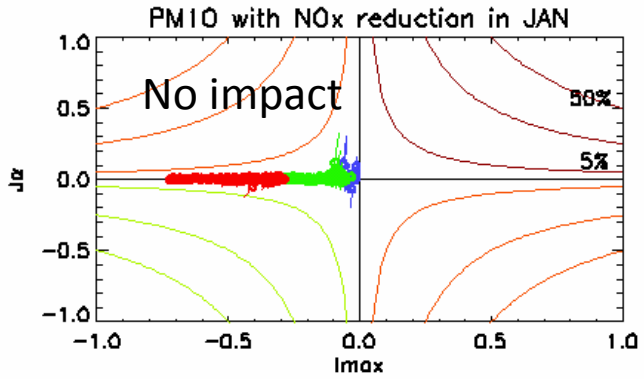
*not included in TAPM

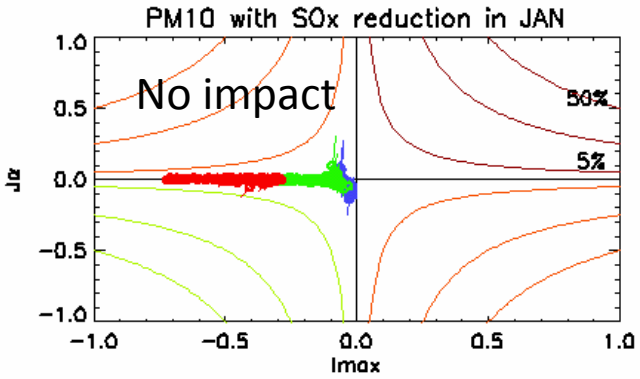


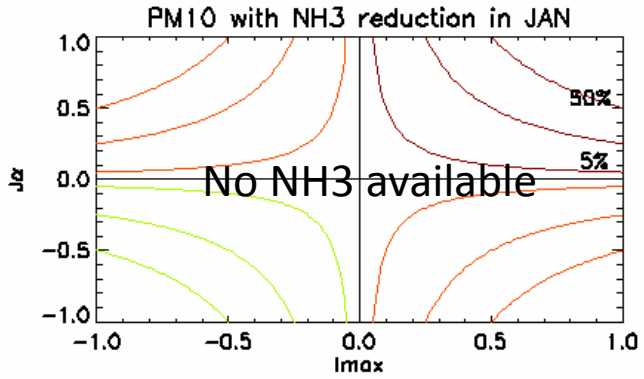
Model results

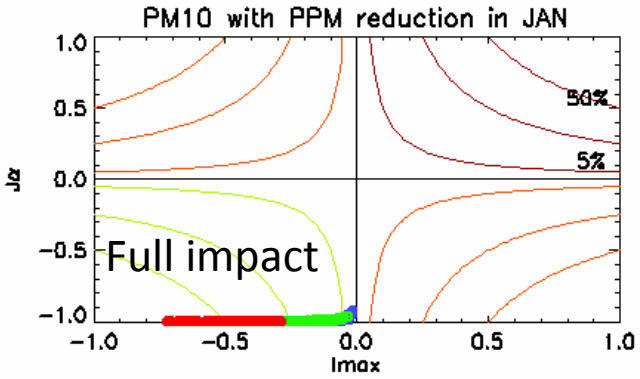


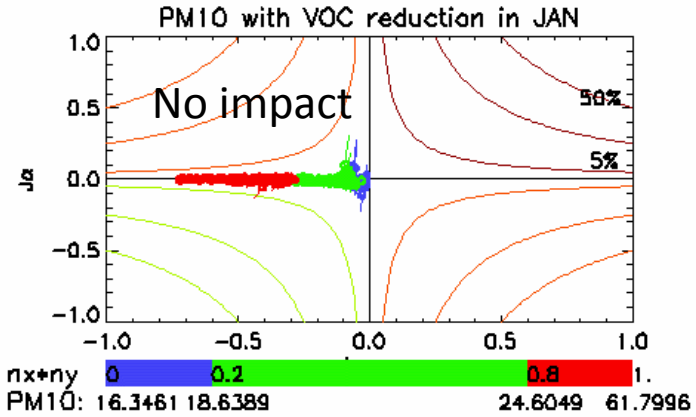
PM10 -- OPO TAPM JAN 2012

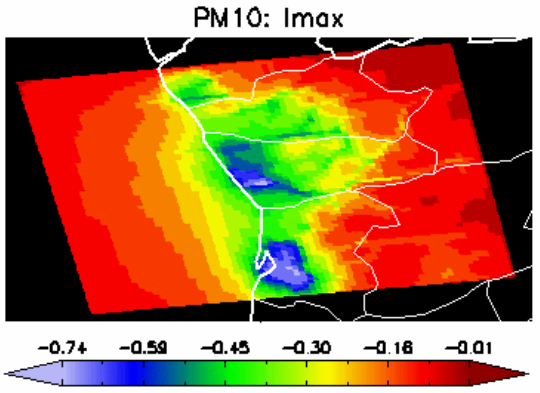




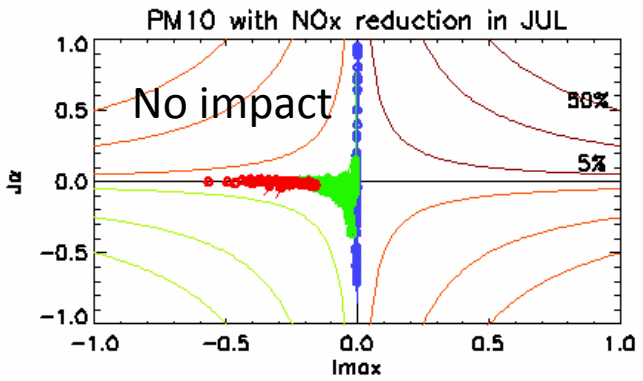


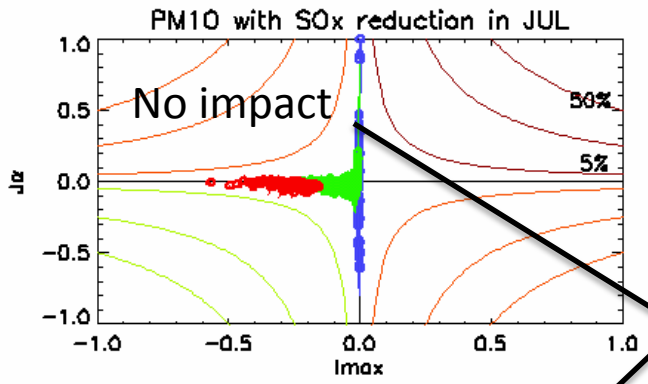




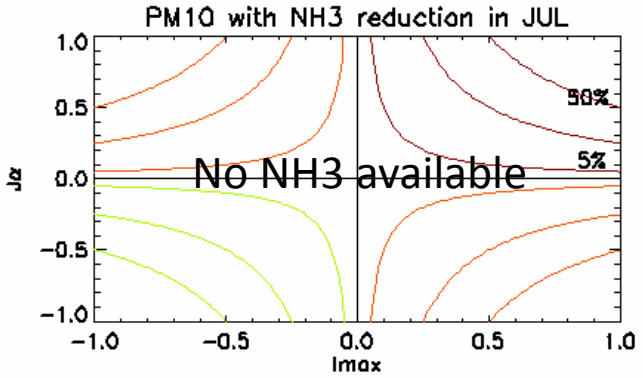


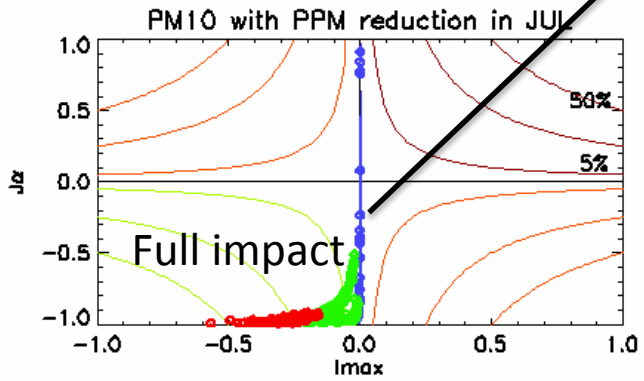
PM10 -- OPO TAPM JUL 2012

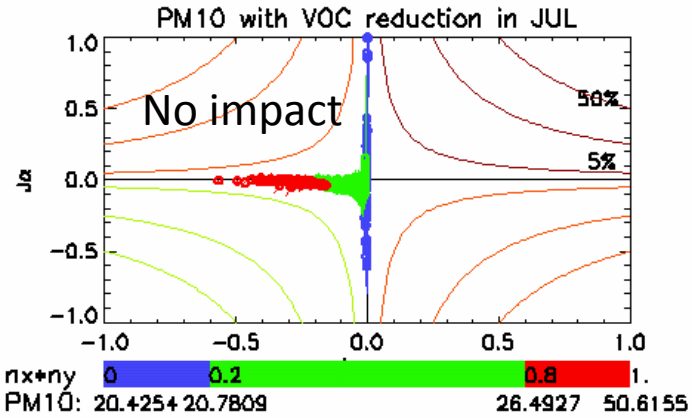


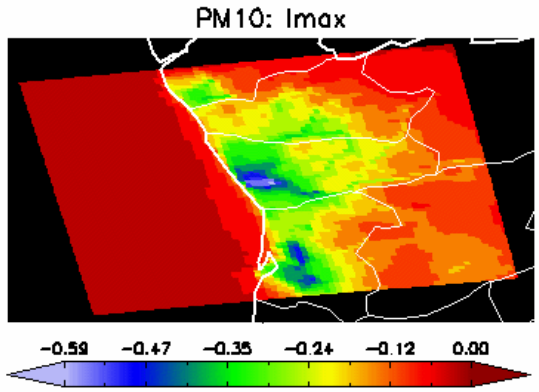


Very low PM10 conc

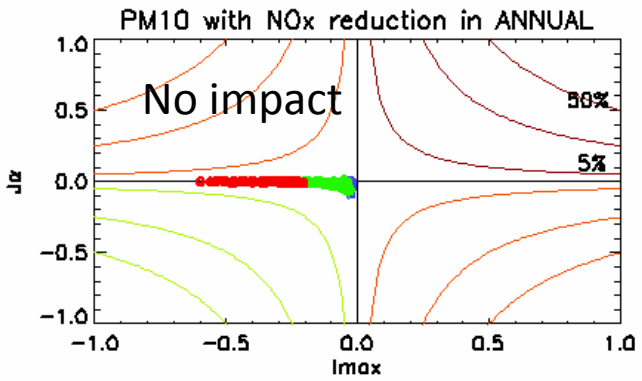


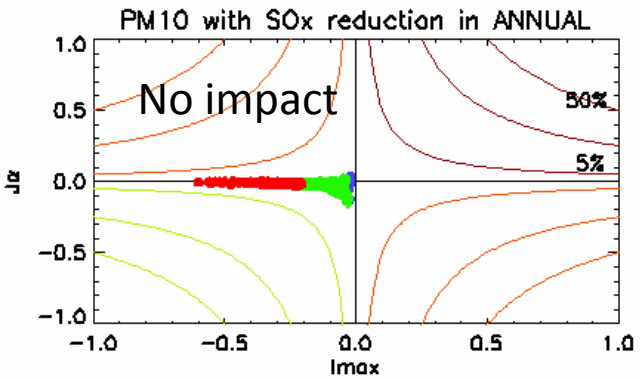


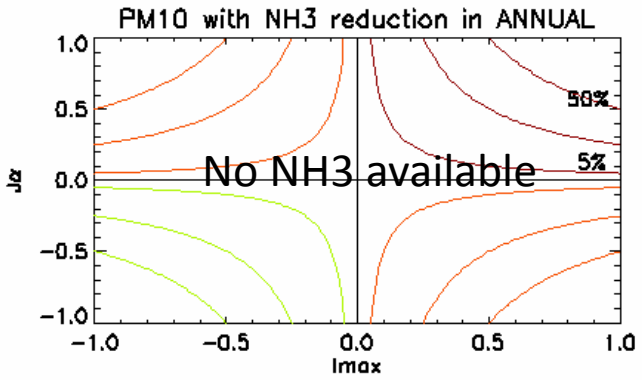


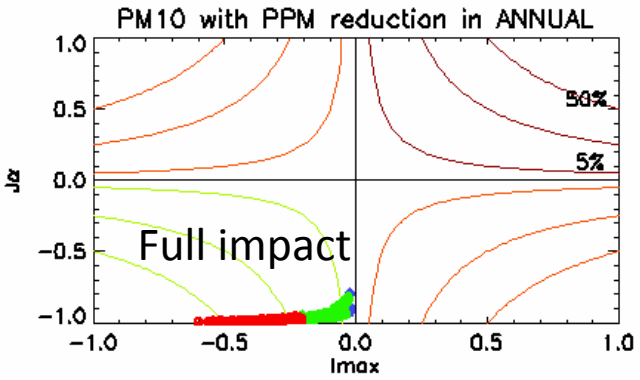


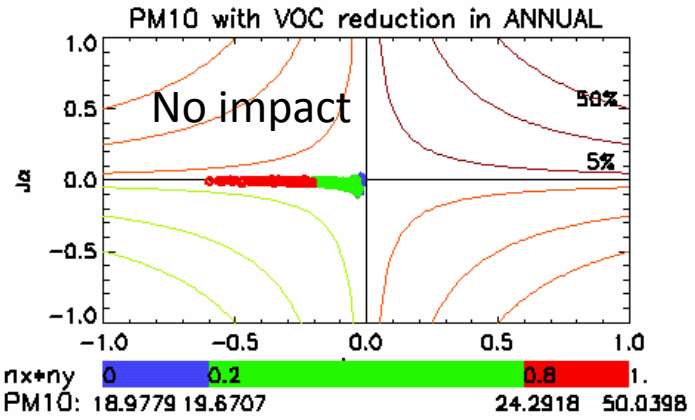
PM10 -- OPO TAPM Annual 2012

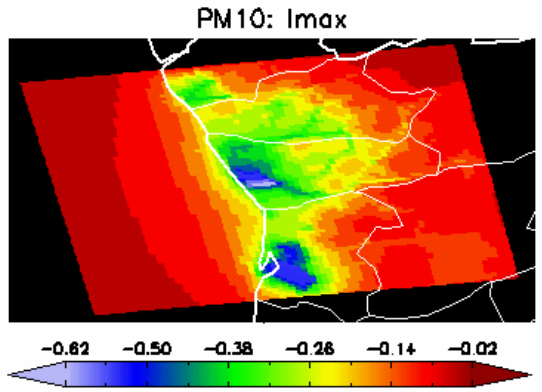






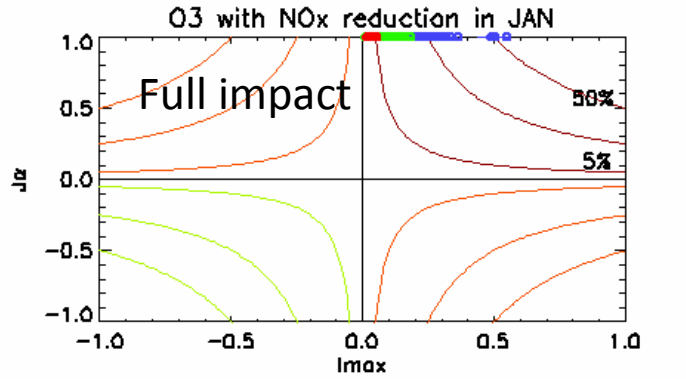


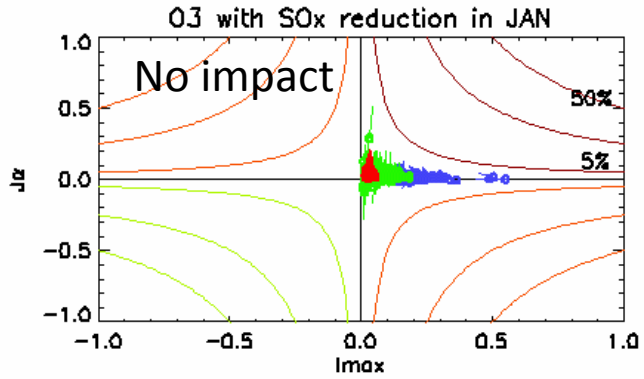


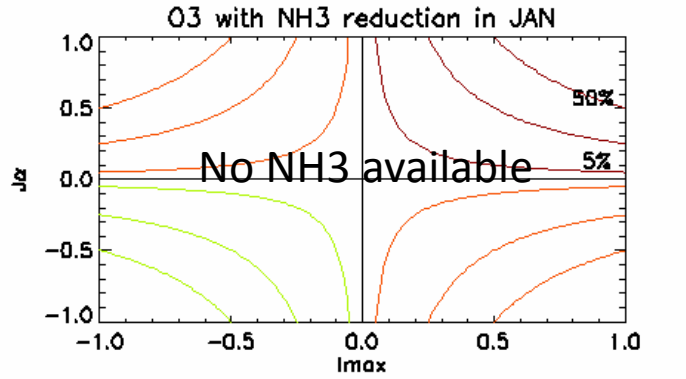


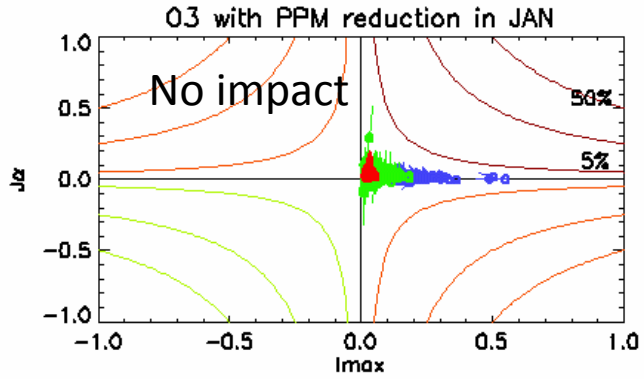
Combination of both season results

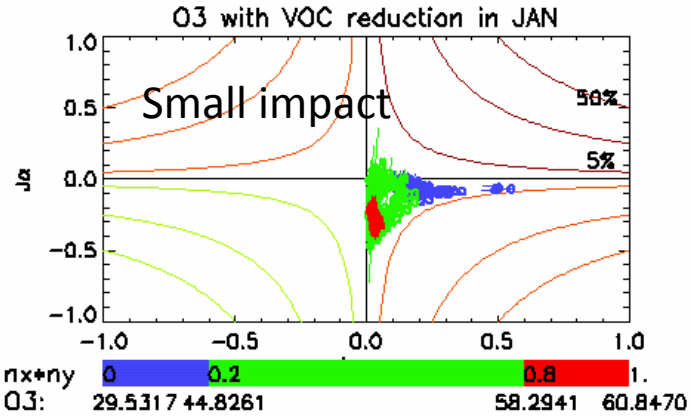
O3 -- OPO TAPM JAN 2012

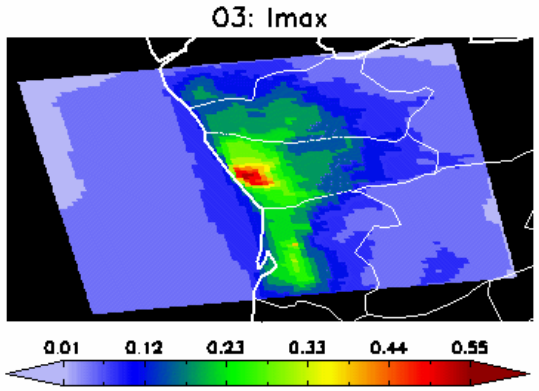












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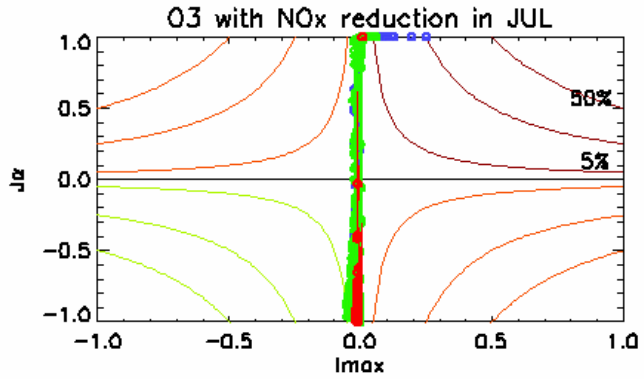
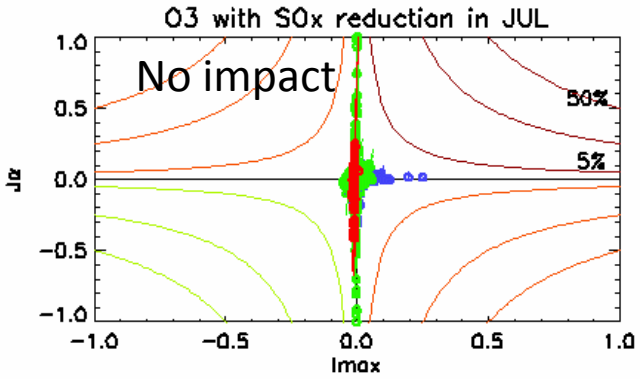
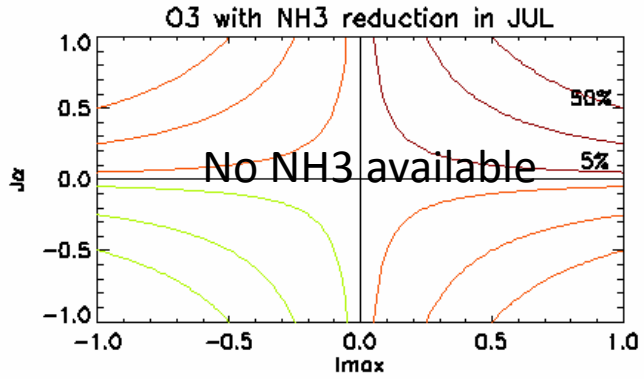
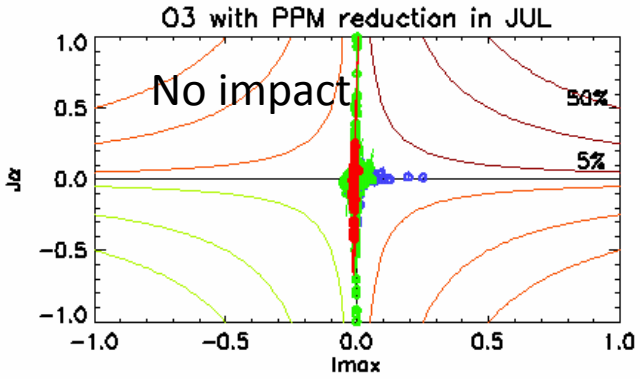
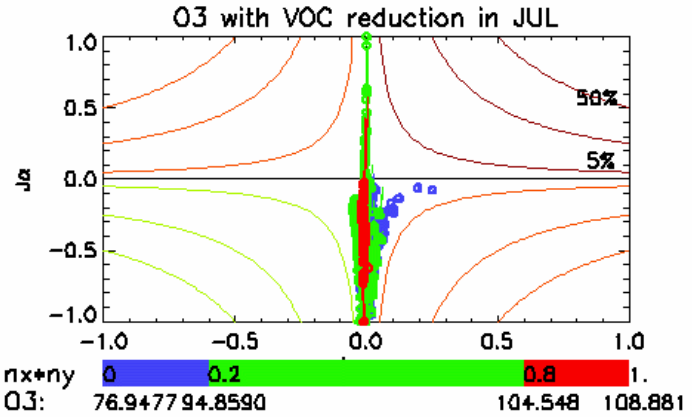
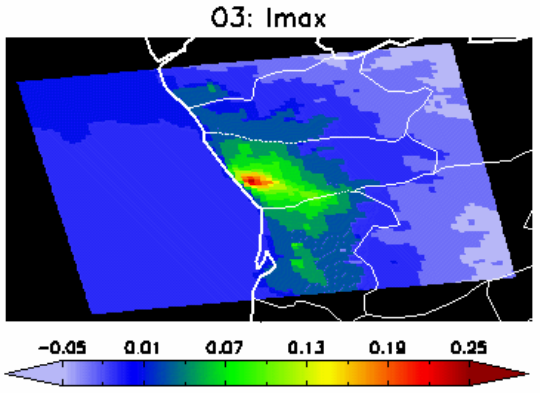












Some comments
(answering the key questions)

Do you think these graphic indicators are adapted to answer the goal of WG4 (i.e. identify a common and simple methodology to evaluate model performances with regards to the simulation of emission reduction scenarios)?

Yes, they are!
Simple and effective.

Some comments
(answering the key questions)

If you have already an experience in model evaluation, do you think such graphic indicators can complete the methodology you are using and how ?

Probably we will adapt them in future model evaluation for planning and scenarios applications.
We will introduce them to APA

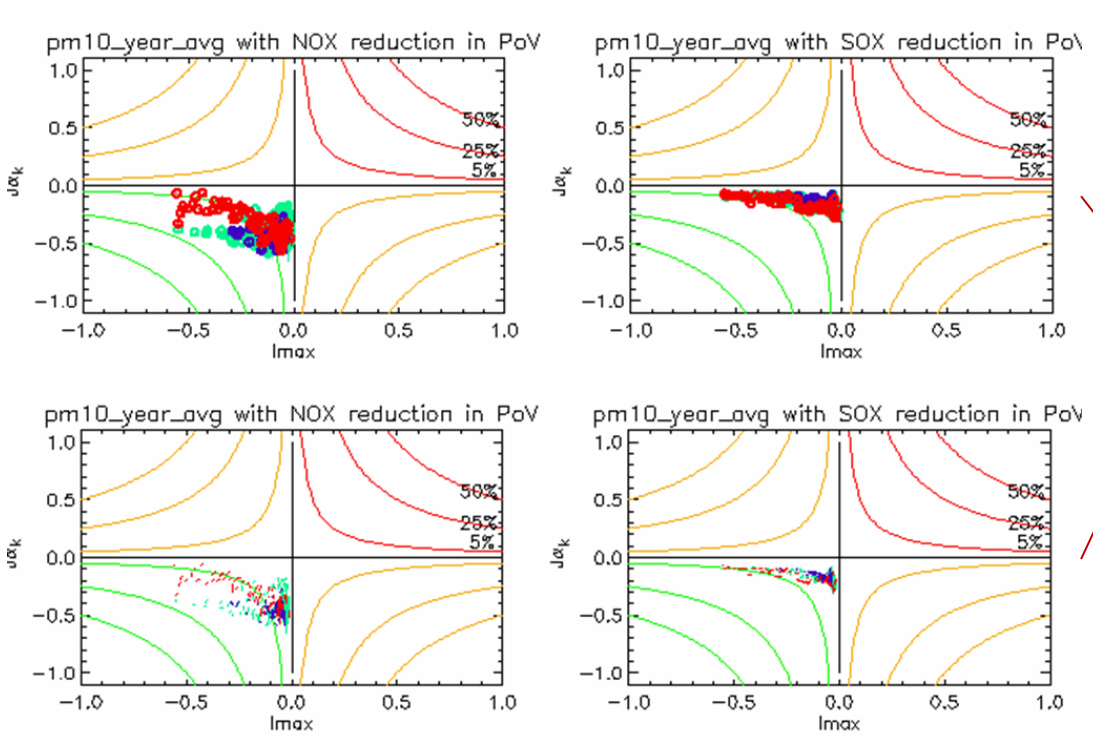
Some comments
(answering the key questions)

Do you think this methodology is general enough to be applied for the model you are using?

We intend to apply it for a more complex CTM.
TAPM has a very simple chemistry module (response linear between emissions and concentration)

Just a note of ATENV paper:

683 Figure 4: The potency diagram is used on the specific case of PM10 which
684 depends on 5 different precursors. NOx and VOC impacts are illustrated here.
685 Each point correspond to a specific grid cell and the color scheme is related to the
686 PM10 concentration value (20th upper percentile in red, 20th lower percentile in
687 blue, and green in between). In the bottom two diagrams, the lines relating the
688 results obtained with two different emissions abatement ratios are shown. They are
689 indicative of the robustness of the model responses.



SOx

The difference between these two plots are not clear