

# MASCOT-NUM Seminar on Visualization methods for uncertainty studies

**Groupement De Recherche  
MASCOT NUM**

Méthodes d'Analyse  
Stochastique  
pour les COdes et  
Traitements NUMériques

<http://www.gdr-mascotnum.fr>

Organizers:

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EDF R&D

**Julien Tierny**  
CNRS/LIP6

**May 22, 2017**



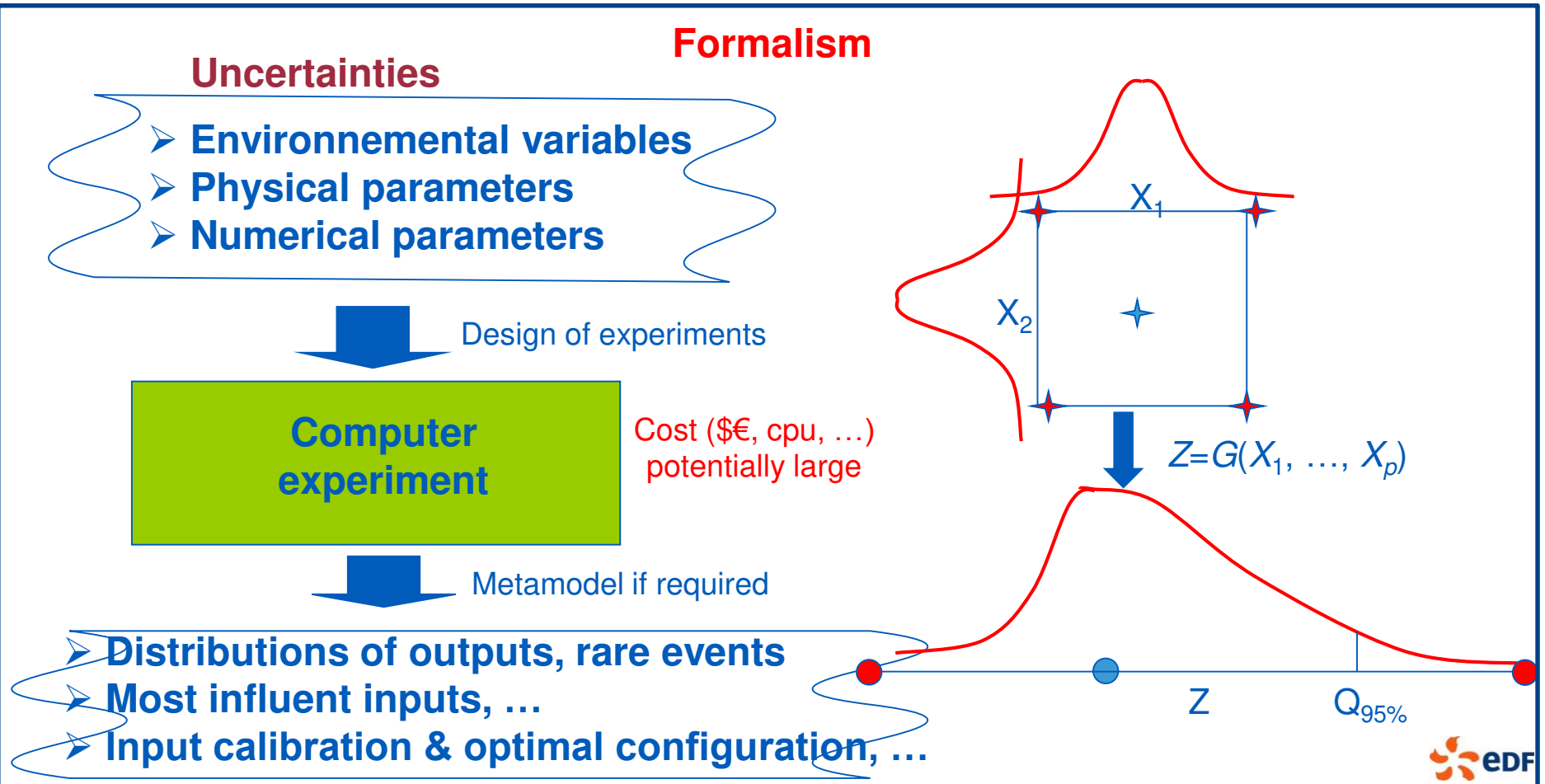
CHANGER L'ÉNERGIE ENSEMBLE

# Computer experiments: Design, analysis & modeling

**Exploratory studies:** understand a **phenomenon**, an experim/indust. process

**Safety studies:** compute a failure **risk** (margins, rare events)

**Design studies:** optimize and manage the system **performances**



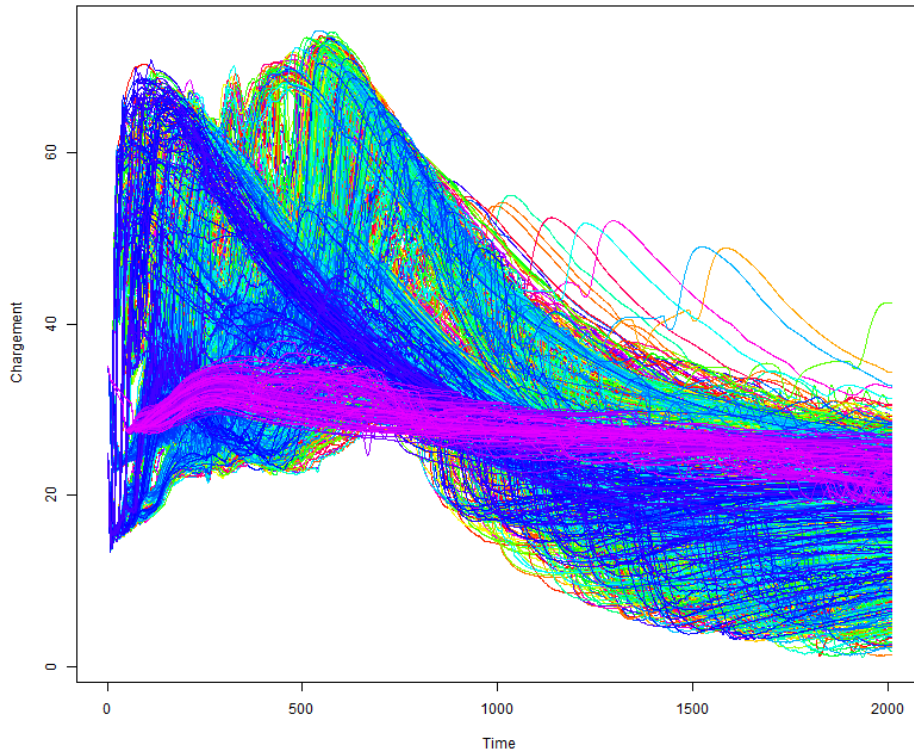
# Visualization issues in uncertainty analysis

► **From a given sample, visualization tools** are essential to summarize information and help decision making

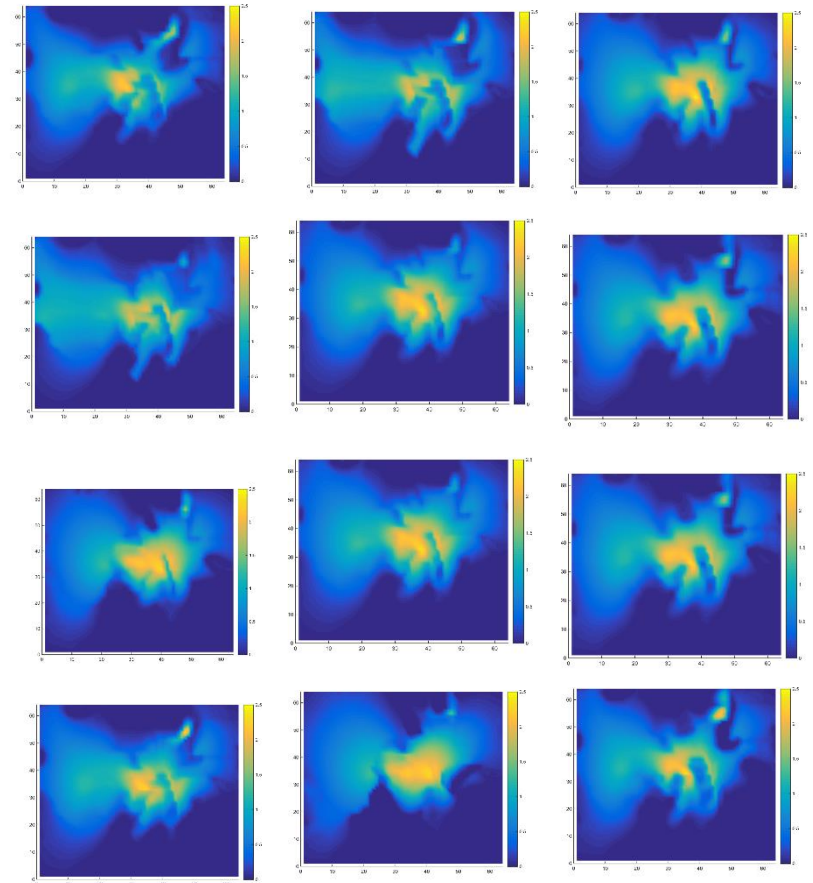
► **Needs of representation tools**

Output curves (fuel temperature)  
from 1865 code runs

Courbes de chargement



12 output fields (pollutant concentration)  
from 300 output fields

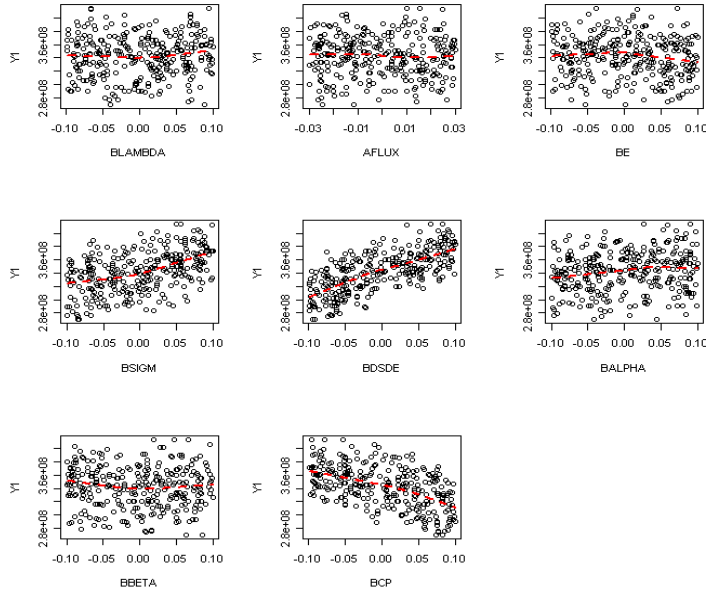


# Visualization issues in sensitivity analysis

Assess input/outputs relationships & potential interactions

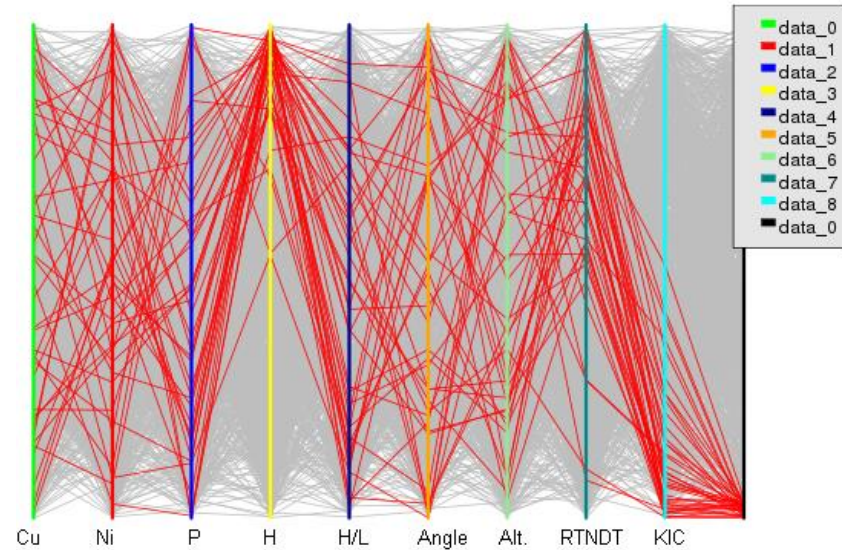
## Scatterplots

Scatterplots



Scalar  
variables

## Cobweb plots



**Important: use of interactive tools**

**Is information easy to catch? Cases of a large number of inputs? ...**



# Seminar with GT Visualization of GdR IG-RV

Informatique Géométrique et Graphique, Réalité Virtuelle et Visualisation

## Agenda

9h20 - [Julien Tierny](#) (CNRS/LIP6) - Topological analysis of data and uncertainty

10h15 - Pause

10h35 - [Michaël Aupetit](#) (Qatar Computing Research Institute) - Reflections on Dimensionality Reduction for Visual Analytics: strengths, weaknesses and perspectives

11h30 - [Yann Richet](#) (IRSN) - Visualisation of parametric scientific computing: Some interactive tools, theoretical frameworks, user experiences

12h00 – Lunch at your convenience (invitation of speakers)

14h00 - [Georges-Pierre Bonneau](#) (INRIA Grenoble Rhône-Alpes) - Visual Perception for Visualization with an application to Uncertainty Visualization

14h55 - [Alejandro Ribes](#) (EDF R&D) - Uncertainty functionalities in the ParaVis scientific visualization software

15h25 - Pause

15h45 - [Isabelle Bloch](#) (LTCl, Télécom ParisTech, Université Paris-Saclay) - Modeling and representation of spatial uncertainty in image processing and understanding

16h40 - [Christoph Kinkeldey](#) (INRIA) - Guidelines to better support the use of uncertainty for geodata analysis and spatial decision making

17h10 - End