

# Overview of GAETAN's latest developments

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## Overview plan

- GAETAN
- GAETAN-FHTS
- CONDOR
- Conclusions and perspectives

## GAETAN 1/3

### WHAT ?

GAETAN : Environment for thermal analysis

- based on ESATAN
- many pre-processing and post-processing features

### WHEN ?

Developed since 1996

GAETAN V3.0.0 (2003)

### WHO ?

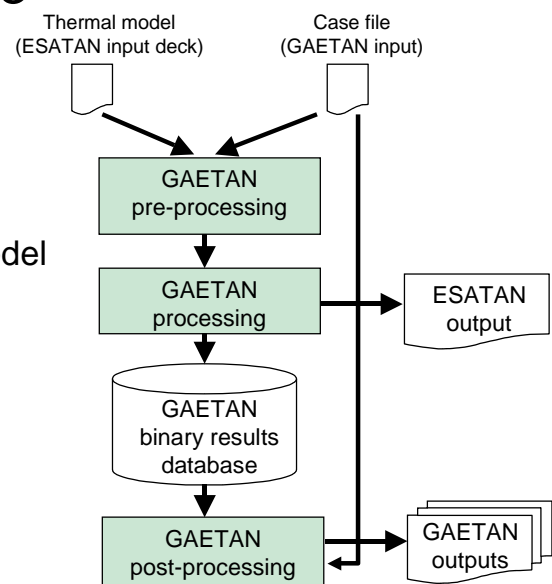
CNES + 3 French industrial users

SILOGIC in charge of extensions and maintenance

## GAETAN 2/3

### 3 modules :

- Pre-processing
  - Structured input data
  - Simplified programming of a model
- Processing (ESATAN)
  - Data base generation
  - Run control functions
- Post-processing



# GAETAN 3/3

## Post-processing tools

- Node grouping, node condensing, temperature difference calculation...
- Comparisons with calculations or tests...
- Statistic, entities values, thermal balances, average temperature...

Caractéristiques du modèle à TO

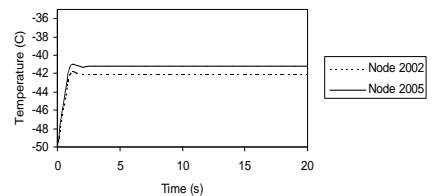
Modèle utilisateur: TEST  
20 Noeuds Mécaniques  
20 Noeuds Fluidiques  
15 Echanges conductifs  
0 Echanges radiatifs  
0 Couplages Fluidiques

```

Bloc de données
TRANSITOIRE
$titre1
Cas de calcul TRANSITOIRE - Sensibilité : none
$titre2
Modèle TEST
ESATAN Version 3.0.0 ESATAN Version 8.7 09:07:27 20/10/03
$titre3
Entités caractéristiques des noeuds de type DIFFUSIF
$label_identification TEST:2002* TEST:2005*
* TEMPS (s) *
* TEMPS (s) *
$nature_parametre CALCUL* CALCUL*
$identification_parametre TEMPERATURE (C)* TEMPERATURE (C)*
$donnees
TEMPS (s) *
* 0.00 * -50.00 * -50.00 *
* 1.00 * -42.02 * -41.28 *
* 2.00 * -42.02 * -41.28 *
* 3.00 * -42.02 * -41.24 *
* 4.00 * -42.02 * -41.24 *
* 5.00 * -42.02 * -41.24 *
* 6.00 * -42.02 * -41.24 *
* 7.00 * -42.02 * -41.24 *
* 8.00 * -42.02 * -41.24 *
* 9.00 * -42.02 * -41.24 *
* 10.00 * -42.02 * -41.24 *
* 11.00 * -42.02 * -41.24 *
* 12.00 * -42.02 * -41.24 *

```

Temperature time dependance



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# GAETAN-FHTS 1/2

## Updates

- Fluidic nodes and entities available in GAETAN
  - All ESATAN-FHTS fluidic nodes entities (T, P, FE, VQ...) and functions (COND, CP, RHO...)
  - Computed entities (TQ, HVF)
- Fluidic node grouping and node condensing

## New features

- Mass and volume balances
- Fluid state report available for thermal balances

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## GAETAN-FHTS 2/2

### Thermal Balances computing

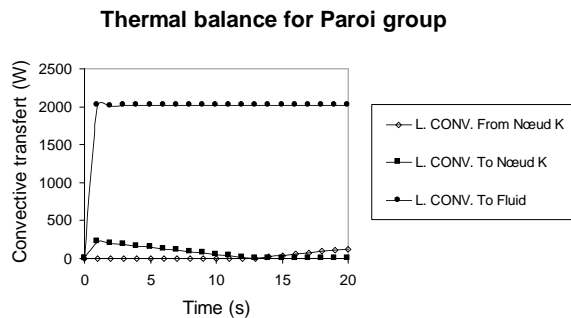
- Conductors (GL, GR, GF) between solid and fluid nodes taken into account in solid node group detailed thermal balance

```

*****
Bilans détaillés par groupe de noeuds
*****

```

Bilan thermique (W) : Paroi Groupe de noeuds de type "Diffusif"	Entrees	Sorties
Destockage / Stockage	0.00	579.18
Dissipation électrique	4500.00	
Transfert convect. avec Nœud K	129.18	
Transfert convect. avec Fluides 1		2025.00
Transfert convect. avec Fluides 2		2025.00
Recapitulatif du bilan (W)	4629.18	4629.18



## CONDOR 1/3

### Presentation

- Software for worse-case external flux conditions evaluation
  - Fast pre-phase analysis
  - Analysis on large models for complex pointings (chaining on ESATAN)
- GUI based on a freeware XML editor
  - License free
  - Standard and light developments
  - Easy to tune

## CONDOR 2/3

### Example of a GUI screen view

Visualise orbit through Esarad

On a cube

Sunsynchronous orbit

Flux yearly averaged

Easy pointing

Attribut	Value
VECTEUR_GEOMETRIE_1_AXE	X
VECTEUR_GEOMETRIE_1_COORDO...	<None>
PONTAGE_VECTEUR_1	Arbi-terre
VECTEUR_GEOMETRIE_2_AXE	Y
VECTEUR_GEOMETRIE_2_COORDO...	<None>
PONTAGE_VECTEUR_2	Normale_orbite_positive
VITESSE_ROTATION_CONSTANTE	3
YAW_STEERING_PARFAIT	<None>
ROLL_DU_YAW_STEERING	<None>
VECTEUR_GEOMETRIE_PERP_SCL...	<None>
VECTEUR_GEOMETRIE_PERP_SCL...	<None>
SOLEIL_DANS_HEMISPHERE_AXE	<None>
SOLEIL_DANS_HEMISPHERE_COO...	<None>

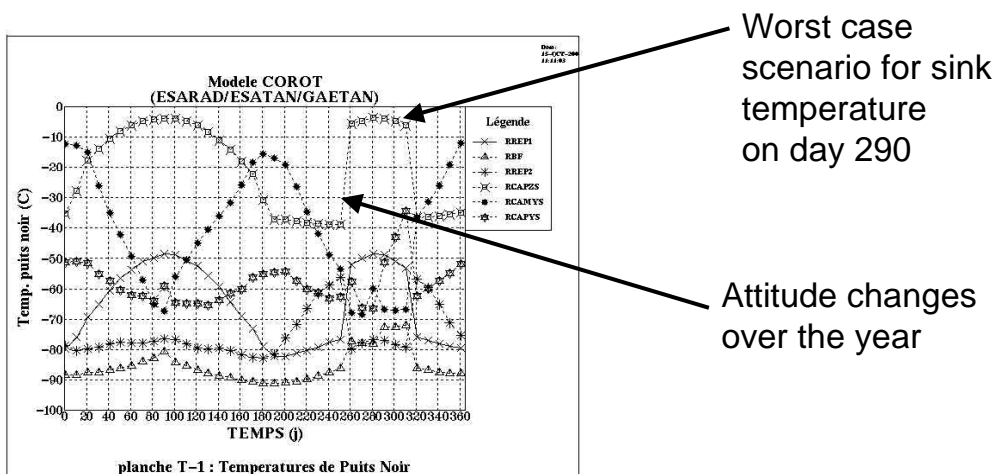
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## CONDOR 3/3

### Output example



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## Conclusions and perspectives

### Conclusions

GAETAN :

Simplifies the launching of ESATAN

Emphasises ESATAN results with advanced analysis functions

Evolutive software (users requests for improvements)

CONDOR/GAETAN/ESATAN/ESARAD :

Complete environment

## Conclusions and perspectives

### Perspectives

GAETAN :

Improvement of the user interface

(use of structured input files)

Improvement of the monitoring of the application

Help for model reduction

SILOGIC : thermal / GUI / model definition / output treatment...

Several skills ready to be used for the next generation of thermal tools (ESATAP)