



**The Development and Service Company for Scilab,**  
The Open Source software for Numerical Computation



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The Open Source software for Numerical Computation

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# Agenda

- Scilab Enterprises
  - Company History
  - Software offer
  - Services offer
- Modelica/Coselica
- Questions - Answers



**The Development and Service Company for Scilab,**  
The Open Source software for Numerical Computation

# Scilab History

1980: First MATLAB

1980 – 1990: BLAISE /BASILE Software INRIA / Simulog - Christian SAGUEZ

## From Research to Industry

1990 - 2003:

- Open Source Scilab (Research)
- 1994: Scilab freely distributed on the net

2003 - 2007:

- Scilab Consortium phase 1 (INRIA) - Claude GOMEZ

2008 - 2012:

- Scilab Consortium phase 2 (DIGITEO)
- Scilab free and Open Source license (compatible GPL)

06/2010 :

- SCILAB ENTERPRISES creation.

07/2012:

- SCILAB ENTERPRISES has the Exclusivity of trademark, development and International deployment of Scilab distribution.

# Scilab Enterprises

- Company created in June 2010
- **The official structure** resulting of the Scilab Consortium which had developed Scilab since 2003
- A high level team who has extensive knowledge of Scilab software and its environment and benefits directly from the Scilab developers expertise.



**Jacques Dhellemmes**  
President



**Christian Saguez**  
Vice President



**Claude Gomez**  
CEO



**Denis Ranque**  
Board Member



Board Members

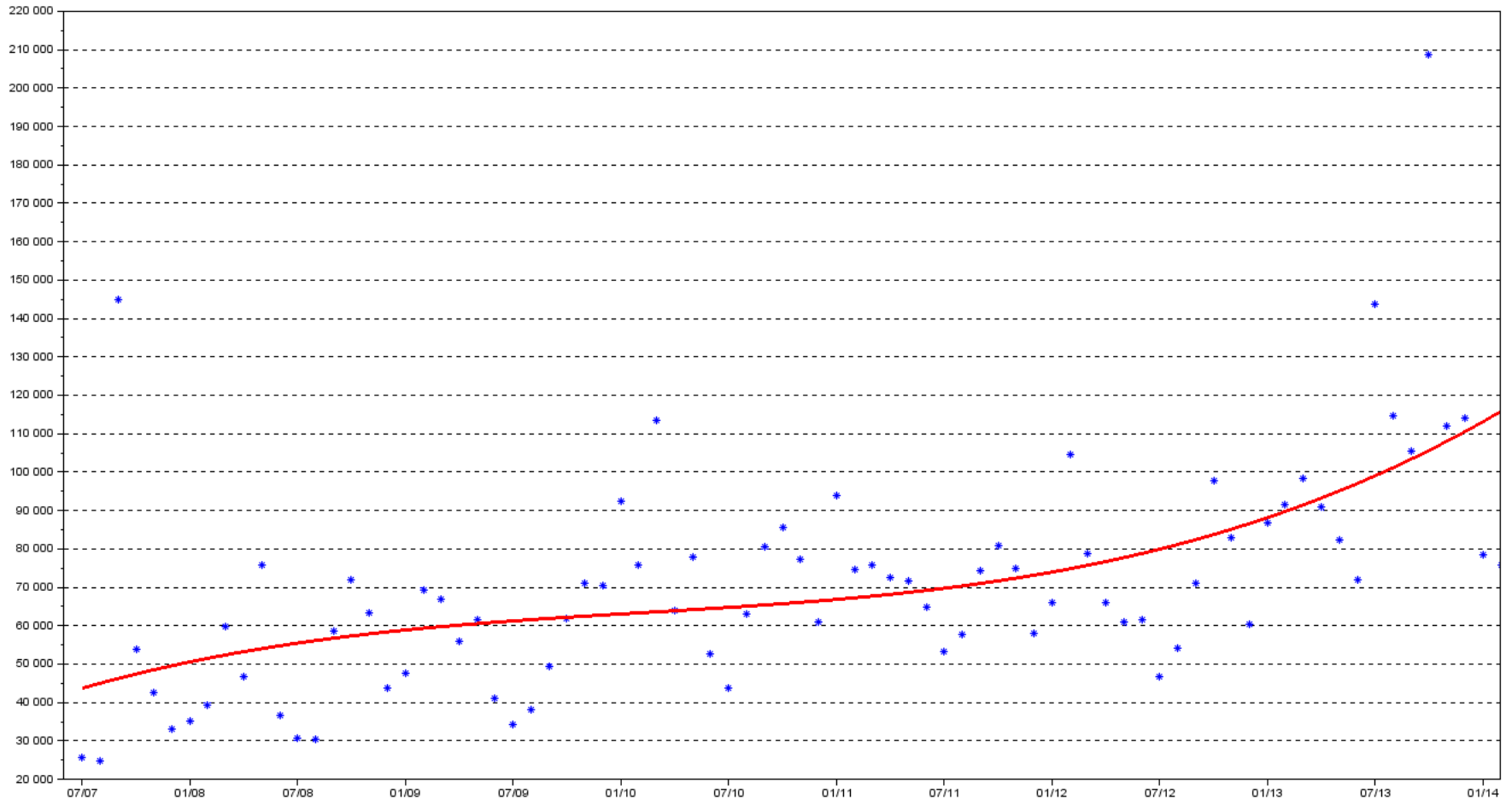
# Scilab distribution

# Scilab In The World

From [www.scilab.org](http://www.scilab.org)

- ~ 100 000 monthly downloads from 150 countries
- ~ 1 000 000 estimated users

Downloads from July 2007 to February 2014





# Scilab Distribution

- Scilab

Powerful Computation Engine

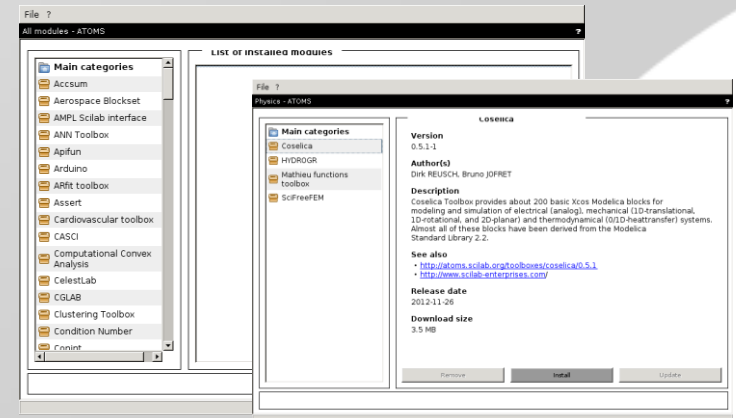
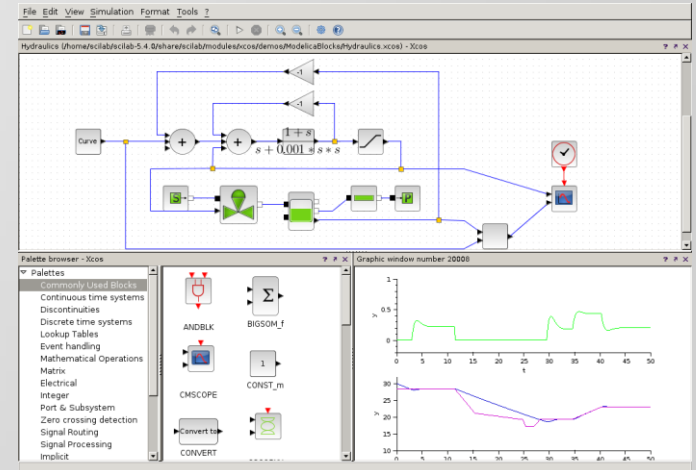
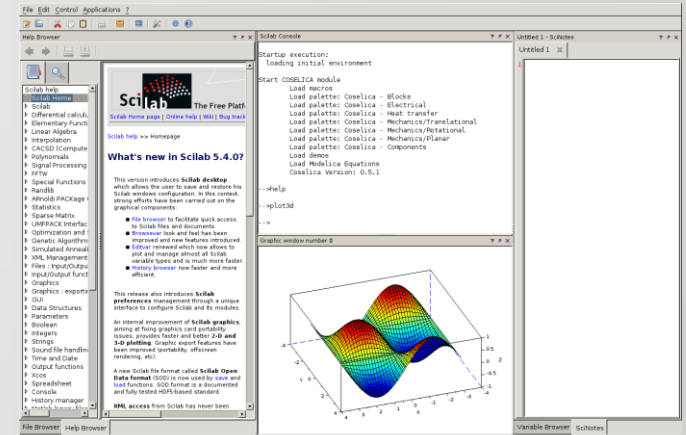
- Xcos

Dynamic Systems Modeling and Simulation

- ATOMS

(AuTomatic mOdules Management for Scilab)

Modules Management



# International Partnership Committee

## The International Scilab Users' Group

President: Gérard Poirier (Dassault-Aviation)



### Role

- Management of Scilab users and developers
- Promotion of Scilab
- Roadmap and external modules proposals
- All kinds of exchanges around Scilab



**SCILABTEC**  
15-16 MAY 2014 / PARIS (FR)

**6<sup>TH</sup>** INTERNATIONAL SCILAB  
USERS CONFERENCE

# **Scilab Enterprises**

## **Our Expertise at your Service**

Development and services offer

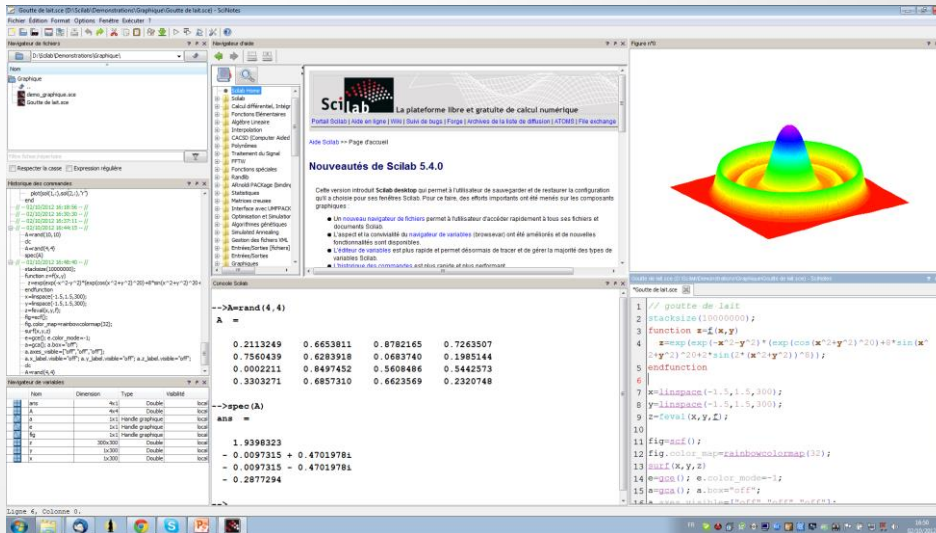
# Maintenance, Support et Services

- Maintenance and On-line and/or On site Support
- Trainings
- Development and Application optimization
- Migration to Scilab
- Specific versions or proprietary optimized
- Private ATOMS server
- Scilab Long Term Support
- External Commercial Modules

# Scilab Software

Latest release 5.5.0

# Scilab 5.5.0 (Avril 2014)



- HDF5 management
- Graphics: speed (Matplot), datatips, interactions, 3-D lightning
- Remote file Access (sciCurl)
- Scilab/MPI (Message Passing Interface)
- JIMS Integration (Java)
- Localization of external modules
- Graphical User Interface (New components)
- Additional Graphics Functionnalities

# User-friendly Environment: easy to program

File Browser

Variable Browser

The screenshot displays the Scilab user interface with four main components:

- File Browser (left):** A tree view showing the file system structure, including folders like Applications, Library, Network, System, Users, Volumes, bin, cores, dev, etc, home, net, private, sbin, tmp, usr, var, and mach\_kernel.
- Console (center):** A terminal window showing the execution of Scilab code. The output includes the initialization process, the generation of a 4x4 matrix 'a', the calculation of its eigenvalues 'ans', and the creation of a 3x3 magic matrix 'b'.
- Variable Browser (right):** A table listing the current variables in the workspace, including their names, dimensions, types, and visibility.
- Command History (bottom right):** A list of the commands entered in the console, such as 'a=rand(4,4)', 'spec(a)', and 'b=testmatrix('magic',3)'.

Nom	Dimension	Type	Visibilité
b	3x3	Double	local
a	4x4	Double	local
home	1x1	Chaîne	local
PWD	1x1	Chaîne	local
%tk	1x1	Booléen	local
%F	1x1	Booléen	local
%T	1x1	Booléen	local
%nan	1x1	Double	local
%inf	1x1	Double	local
SCI	1x1	Chaîne	local
SCIHOME	1x1	Chaîne	local
TMPDIR	1x1	Chaîne	local
%gui	1x1	Booléen	local
%ftw	1x1	Booléen	local
%t	1x1	Booléen	local
%f	1x1	Booléen	local
%eps	1x1	Double	local
%io	1x2	Double	local
%i	1x1	Double	local
%e	1x1	Double	local
%pi	1x1	Double	local
%modalWarning	1x1	Booléen	global
%driverName	1x1	Chaîne	global
%exportFileNa...	1x1	Double	global
%toolboxes	1x1	Double	global
%toolboxes_dir	1x1	Chaîne	global
%helps	1x1	Double	global

```
Initialisation :
Chargement de l'environnement de travail

-->a=rand(4,4)
a =

    0.2113249    0.6653811    0.8782165    0.7263507
    0.7560439    0.6283918    0.0683740    0.1985144
    0.0002211    0.8497452    0.5608486    0.5442573
    0.3303271    0.6857310    0.6623569    0.2320748

-->spec(a)
ans =

    1.9398323
   - 0.0097315 + 0.4701978i
   - 0.0097315 - 0.4701978i
   - 0.2877294

-->b=testmatrix('magic',3)
b =

    8.    1.    6.
    3.    5.    7.
    4.    9.    2.

-->|
```

Historique des commandes

```
// -- 01/01/2012 10:42:45 -- //
a=rand(4,4)
spec(a)
b=testmatrix('magic',3)
```

Console

Command History

# Embedded Tools

```

1 //Définition directe de la transformée de Fourier discrète
2 //-----
3 function xf=DFT(x, flag);
4     n=size(x, 'l');
5     //Calcul de la matrice de Fourier (n by n l)
6     if flag==1 then, //transformation inverse
7         am=exp(2*pi*1i*(0:n-1)*(0:n-1)/n);
8     else //transformation directe
9         am=exp(-2*pi*1i*(0:n-1)*(0:n-1)/n);
10    end
11    xf=am*matrix(x,n,1)/n; //dft
12    xf=matrix(xf,size(x)); //mise en formz
13    if flag==1 then,xf=xf/n;end
14 endfunction
15
16 //Comparaison avec l'algorithme de la transformée rapide:
17 a=rand(1,1000);
18 norm(DFT(a,1) - fft(a,1))
19 norm(DFT(a,-1) - fft(a,-1))
20
21 timer();DFT(a,-1);timer()
22 timer();fft(a,-1);timer()
    
```

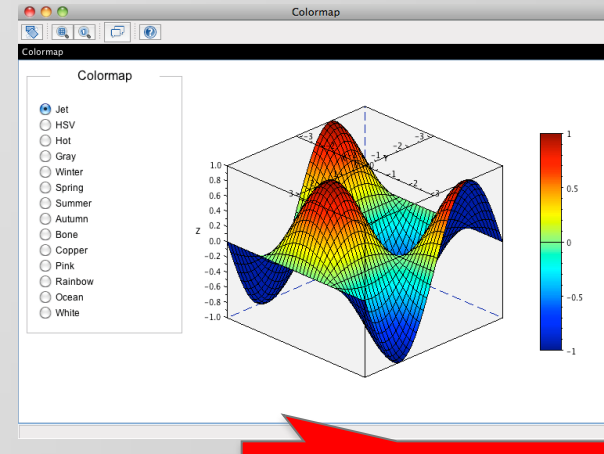
Editor

Nom	Dimension	Type	Visibilité
subdemolist	8x2	Chaîne local	
b	3x3	Double local	
a	4x4	Double local	
home			
PWD			
%tk			
%F			
%T			
%nan			
%inf			
SCI			
SCIHOME			
TMPDIR			
%gui			
%ftw			
%f			
%s			
%eps			
%i			
%e			
%pi	1x1		
%modaWarning	1x1		
%driverName	1x1		
%exportFileName	1x1		

Var - a	1	2	3	4	5
1	0,2113	0,6654	0,8782	0,7264	
2	0,756	0,6284	0,0684	0,1985	
3	2,2113e-...	0,8497	0,5608	0,5443	
4	0,3303	0,6857	0,6624	0,2321	
5					
6					
7					

Variable Editor



2-D/3-D Visualization

Equations Différentielles >> ode\_discrete

ordinary differential equation solver, discrete time simulation

### Calling Sequence

```
y=ode('discrete',y0,ko,kvect,t)
```

### Arguments

- y0: real vector or matrix (initial conditions).
- t0: real scalar (initial time).
- f: external i.e. function or character string or list.
- ko: integer (initial time).
- kvect: integer vector.

### Description

With this syntax (first argument equal to 'discrete') ode computes recursively  $y(k+1)=f(k,y(k))$  from an initial state  $y(k_0)$  and returns  $y(k)$  for  $k$  in  $kvect$ .  $kvect(1)$  must be greater than or equal to  $ko$ .

### Examples

```
y1=[2;3]; %def('opns_function(k,y)', 'opns_y=4*y(k)');
A=[1,2;0,1]; %def('A(k)', 'A=[1,2;0,1]');
y=ode('discrete',y1,1,1,A,function);
%[1,1;A(1),1];
// New y evaluated at [2,3,5,7,9]
y=ode('discrete',y1,1,1,A,function)
```

Embedded Help

Aerospace - ATOMS

CelestLab

- Tous les modules
- Aerospace
- Data Acquisition
- Data Analysis And Statistics
- Data Handling
- Education
- GUI
- Graphics
- Linear algebra
- Modeling and Control Tools
- Number theory
- Numerical Maths
- Optimization
- Physics
- Scilab development
- Signal Processing
- Technical

Version: 2.1.1-1

Auteur(s):

Description: CelestLab is a library of space flight dynamics functions written in Scilab. This library has been developed by CNES (Centre National d'Etudes Spatiales) for mission analysis purposes. It is used for trajectory analysis and orbit design for various types of missions (around Earth, interplanetary...).

You may leave comments below (any remark, suggestions...). But if you would like to report bugs, please go to: <http://forge.scilab.org>

Voir aussi: <http://atoms.scilab.org/toolboxes/celestlab/2.1.1>

Date de sortie: 2011-01-06

Taille du téléchargement: 2 Mo

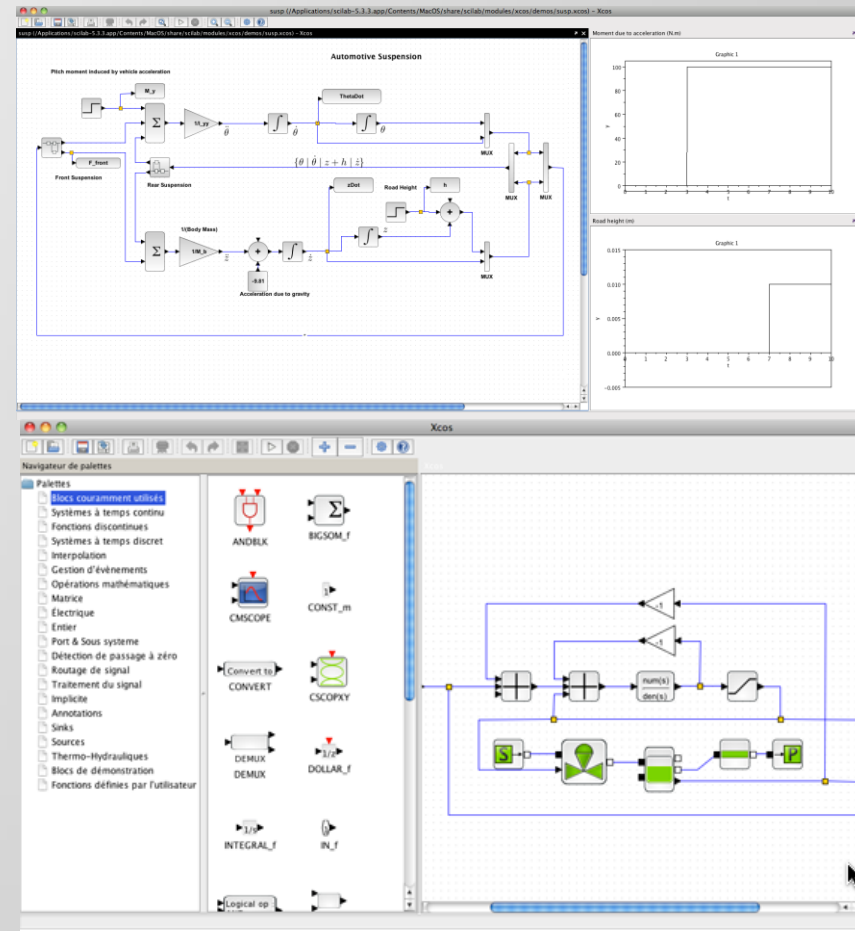
Installer

External Modules Manager



# Xcos, Dynamic Systems Modeling & Simulation

- Professional tool for Industrial needs
- Intuitive and Ergonomic GUI
- Model Construction , Edition & Customization
- **Integrated Modelica Compiler**
- **Freely Available and distributed with Scilab**



# Xcos main features

- Graphically model, compile, and simulate dynamical systems
- Combine continuous and discrete-time behaviors in the same model
- Select model elements from Palettes of standard blocks
- Program new blocks in C, Fortran, or Scilab language
- HDF5 standard which has been chosen to guarantee data exchanges between Scilab and Xcos Editor
- Modelica compiler which enables the simulation of implicit diagrams
- Graphical user interface based on JGraphX

# Xcos

- Easy to customize
- Solver - Compiler
  - Scilab et C
- Blocks Librairies
  - Elementary Blocks librairies
  - Scilab (Interfacing functions) et C (simulation functions)
- Modelica Compiler
- C code Generator

# Scilab / Xcos and Modelica

# Xcos / Modelica

- Initialization with Scicos within RNTL projects:
  - SIMPA
    - Scicos Extension
    - Scicos editor which allow to have Scicos and Modelica Blocks in the same diagram
    - Pre compilation workflow: Modelica Blocks => Modelica program => code C => Scicos blocks
  - SIMPA2
    - Scicos and Modelica compatible Formalism :
      - « when », « edge » Modelica  $\Leftrightarrow$  activation Scicos
      - Event Notion
      - Reset continuous-time state by event, ...
    - Each blocks could be in Modelica, C or Scilab
    - Scilab/Scicos/Modelica : Complete simulation environment, open and free

# Coselica ATOMS Module

- MultiPhysics Simulation
- Developed by: Dirk REUSCH, Bruno JOFRET
- Actual Version: 0.6.3-1
- Package maintainer : Scilab Enterprises
- Coselica Toolbox provides about 200 basic Xcos Modelica blocks for modeling and simulation of electrical (analog), mechanical (1D-translational, 1D-rotational, and 2D-planar) and thermodynamical (0/1D-heattransfer) systems. Almost all of these blocks have been derived from the Modelica Standard Library 2.2.

# Scilab / Xcos Modelica Future

- OpenModelica Integration
  - IRT System X project already validated and open (Industrial participation opened)
- Libraries
  - New blocks
  - Improvement and enhancement

# Demonstration / Examples



# Conclusion



## **Scilab Enterprises is your Partner for your Scilab Implementation and Use.**

Scilab is the worldwide opensource professional reference for numerical computation to industry, education and research:

- Integration of scientific results
- Links with opensource and/or commercial software



# Where to find information ?

## ■ Industrials

<http://www.scilab-enterprises.com>

- Services
- Trainings
- Development
- Support
- ...



The screenshot shows the homepage of Scilab Enterprises. At the top, there is a navigation menu with links for 'Produits', 'Services', 'Assistance', 'Partenaires', and 'Société'. The main banner features a photograph of three people working at a computer, with the text 'Les experts Scilab à votre service'. Below the banner, there are several sections: 'Notre compétence d'éditeur à votre service', 'Notre offre exclusive sur Scilab', 'Nos solutions', 'Actualités', and 'Contact'. The footer contains a copyright notice for Scilab Enterprises S.A.S 2013 and a link to the site plan.

Scilab Enterprises - Scilab

www.scilab-enterprises.com/fr

En Fr Recherche

Produits Services Assistance Partenaires Société

Les experts Scilab à votre service

**Notre compétence d'éditeur à votre service**

Forts de nos connaissances et de notre expertise d'éditeur, notre stratégie consiste à promouvoir cette valeur ajoutée dans la conception de solutions et de services autour du logiciel Scilab. Notre gamme de services vous offre une prestation globale de qualité répondant à vos besoins.

**Notre offre exclusive sur Scilab**

Tous vos projets d'ingénierie ont une solution avec Scilab :

- > Conseil
- > Migration et déploiement
- > Assistance et support
- > Formation
- > Développements spécifiques

**Nos solutions**

Pour le calcul numérique, la simulation, la visualisation et la conception de systèmes

- > **Scilab**  
Logiciel open source gratuit de calcul numérique
- > **Xcos**  
Outil open source gratuit de modélisation et de simulation de systèmes dynamiques hybrides

**Actualités**

- 18 janvier 2013  
Scilab Enterprises aux NIDays 2013
- 10 janvier 2013  
Scilab au FOSDEM'13
- 02 janvier 2013  
Meilleurs Vœux 2013

[Toutes les actualités](#)

**Contact**

**Scilab Enterprises**  
143 bis rue Yves Le Coz  
78000 Versailles - France  
Tél. : 01.80.77.04.60  
[Nous contacter](#) | [Plan d'accès](#)

Société Partenaires Ressources  
Actualités Support Contact

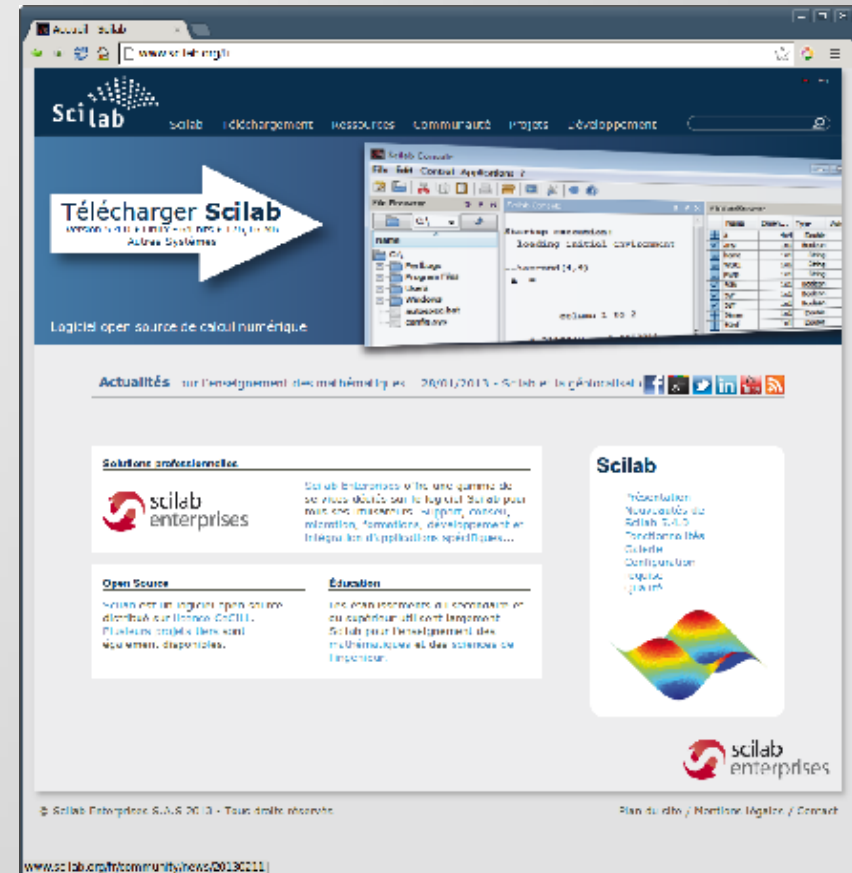
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Plan du site / Mentions légales

# Where to find informations ?

## ■ Community

- Scilab website : <http://www.scilab.org>
  - Versions Downloads
  - Centralized Informations
- On-line Help : <http://help.scilab.org>
- ATOMS : <http://atoms.scilab.org>
  - Web Portal ATOMS
  - All external Scilab modules
- FileExchange : <http://fileexchange.scilab.org>
  - Files sharing, examples, demonstrations
- Bugzilla : <http://bugzilla.scilab.org>
  - A problem ?
  - A requested functionality ?



# Other Community Ressources

- Forge: <http://forge.scilab.org>
  - Development Infrastructure
  
- Codereview: <http://codereview.scilab.org>
  - Scilab developments followup
  
- To go further
  - Wiki: <http://wiki.scilab.org>
  - Users Mailing Lists: <http://www.scilab.org/development/ml>
    - [users-fr@lists.scilab.org](mailto:users-fr@lists.scilab.org)

# Questions and Answers

**Thanks a lot for your time and attention!**