PCEnv, COR & OpenCell

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Introduction (I)

- Since its release in 2001, several CellML tools and techniques have become available. They are dedicated to:
  - Editing (both visual and textual);
  - Validation (both CellML and units);
  - Sharing and curation (through an online repository);
  - Code generation (for external use); and
  - Simulation of CellML models.

Introduction (II)

	AGOS[a]	CESE[b]	COR[c]	JSim[d]	PCEnv[e]	PyCml[f]	VCell[g]
CellML version	1.0	1.0	1.0	1.0	1.0/1.1	1.0	1.0
editing	import	import	yes	import/ export	some	no	import/ export
validation	some	some	yes	some	some	yes	some
units (validation/ conversion)	no	no	validation	yes	some	yes	no
code generation	yes	no	yes	no	yes[h]	yes	no
simulation	yes	yes	yes	yes	yes	no	yes
environment supported[i]	I	W/L/M	W	W/L/M	W/L	I/W/L/M	W/L/M

[a]API generator for ODE Solution (AGOS; see http://www.fisiocomp.ufjf.br/).
[b]Cell Electrophysiology Simulation Environment (CESE; see http://cese.sourceforge.net/).
[c]Cellular Open Resource (COR; see http://cor.physiol.ox.ac.uk/).
[d]JSim (see http://www.physiome.org/jsim/).
[e]Physiome CellML Environment (PCEnv; see http://www.cellml.org/tools/pcenv/).
[f]PyCml (see https://chaste.ediamond.ox.ac.uk/cellml/).
[g]Virtual Cell (VCell; see http://www.nrcam.uchc.edu/).
[h]Via CCGS (see §3*d*(i)).
[i]I, Internet (through a Web interface); W, Microsoft Windows; L, Linux; M, Mac OS X.

Garny et al. CellML and associated tools and techniques. *Phil Trans R Soc A* **366**: 3017-3043 (2008).

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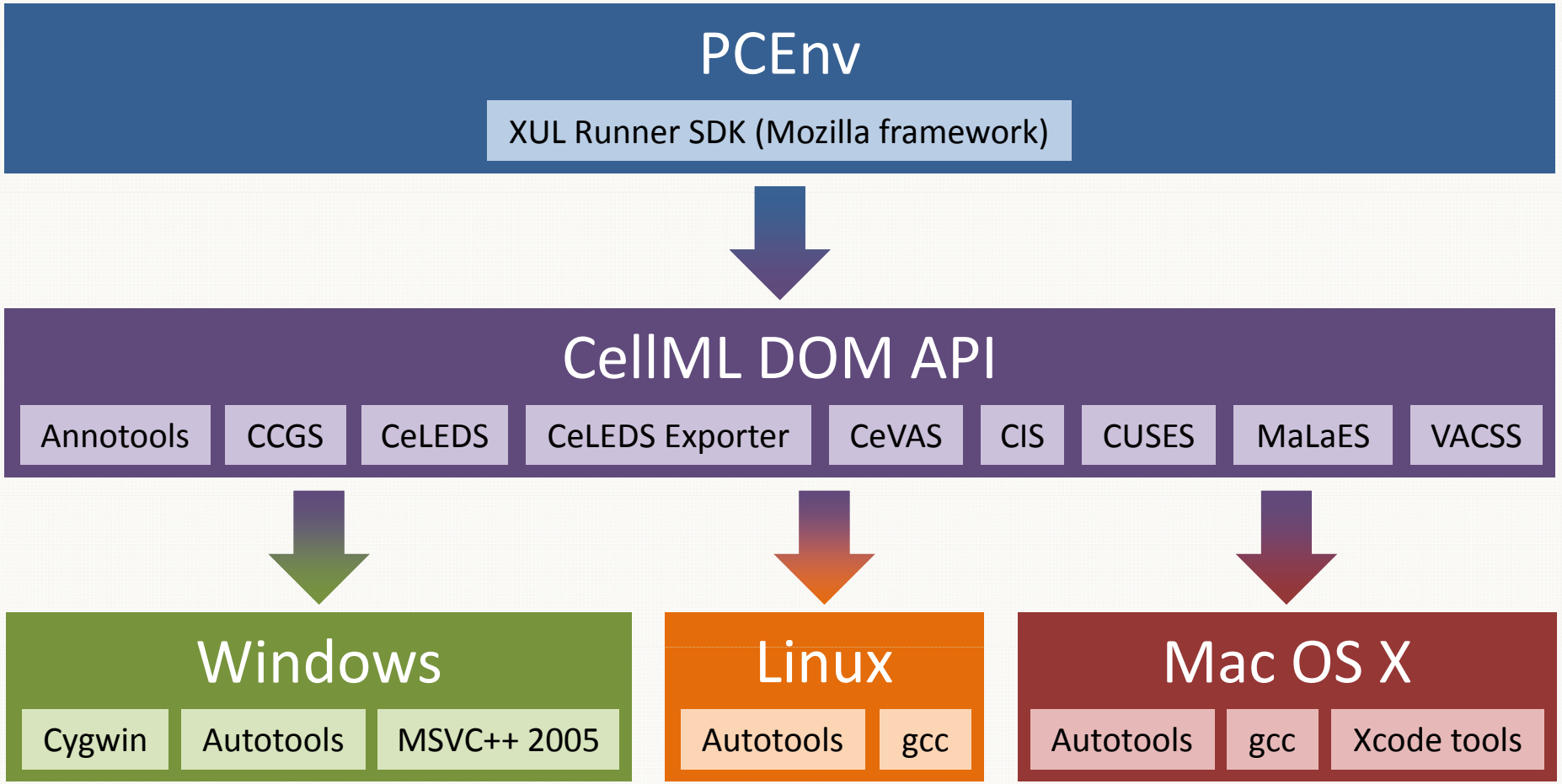
PCEnv (I)


PCEnv
XUL Runner SDK (Mozilla framework)
CellML DOM API
Annotools
CCGS
CeLEDS
CeLEDS Exporter
CeVAS
CIS
CUSES
MaLaES
VACSS
Windows
Cygwin
Autotools
MSVC++ 2005
Linux
Autotools
gcc
Mac OS X
Autotools
gcc
Xcode tools

PCEnv (II)

- Several versions of PCEnv have been released over the past year. Some key features include:
  - PCEnv 0.4: graphical rendering of mathematics, units, etc., as well as C export of generated code;

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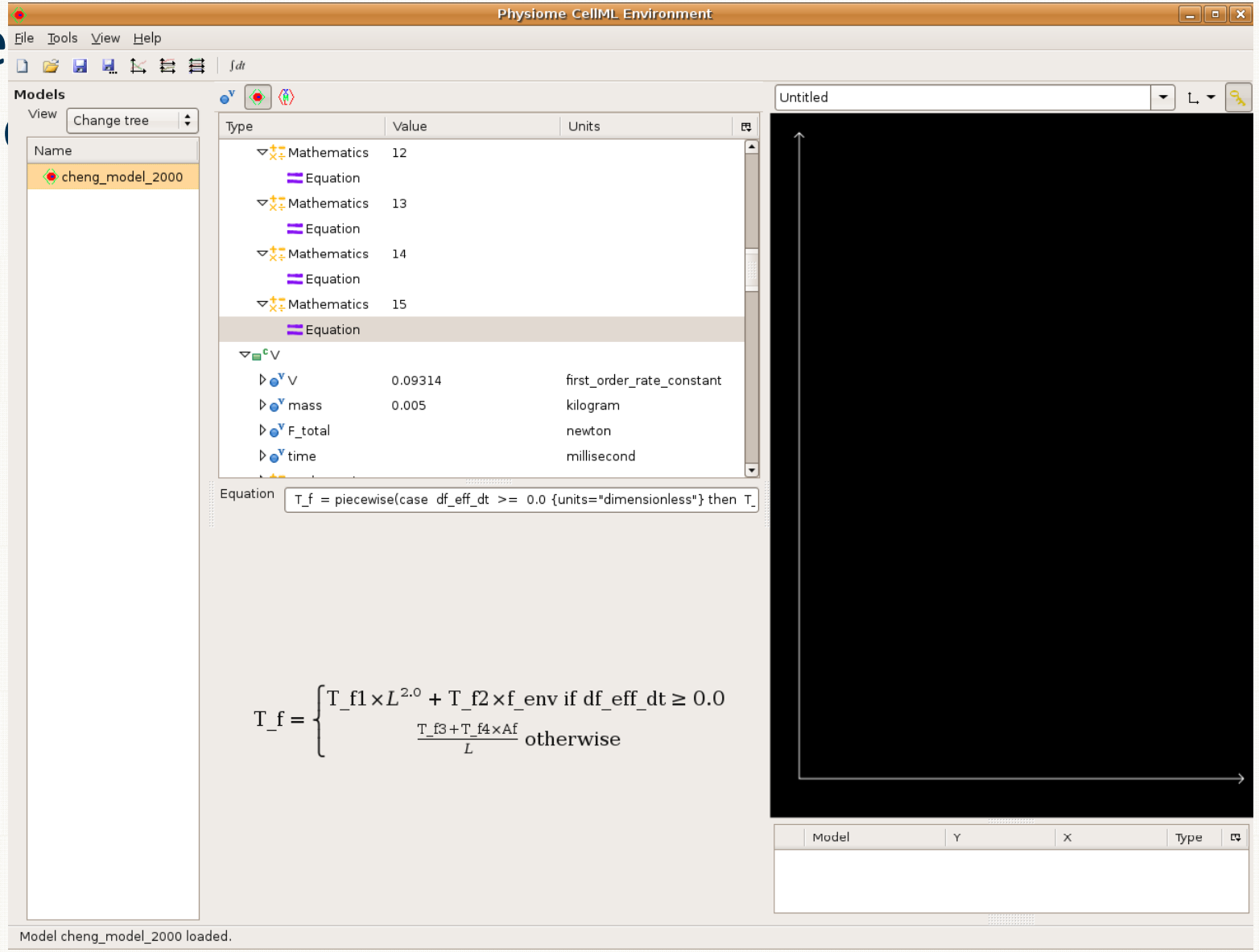

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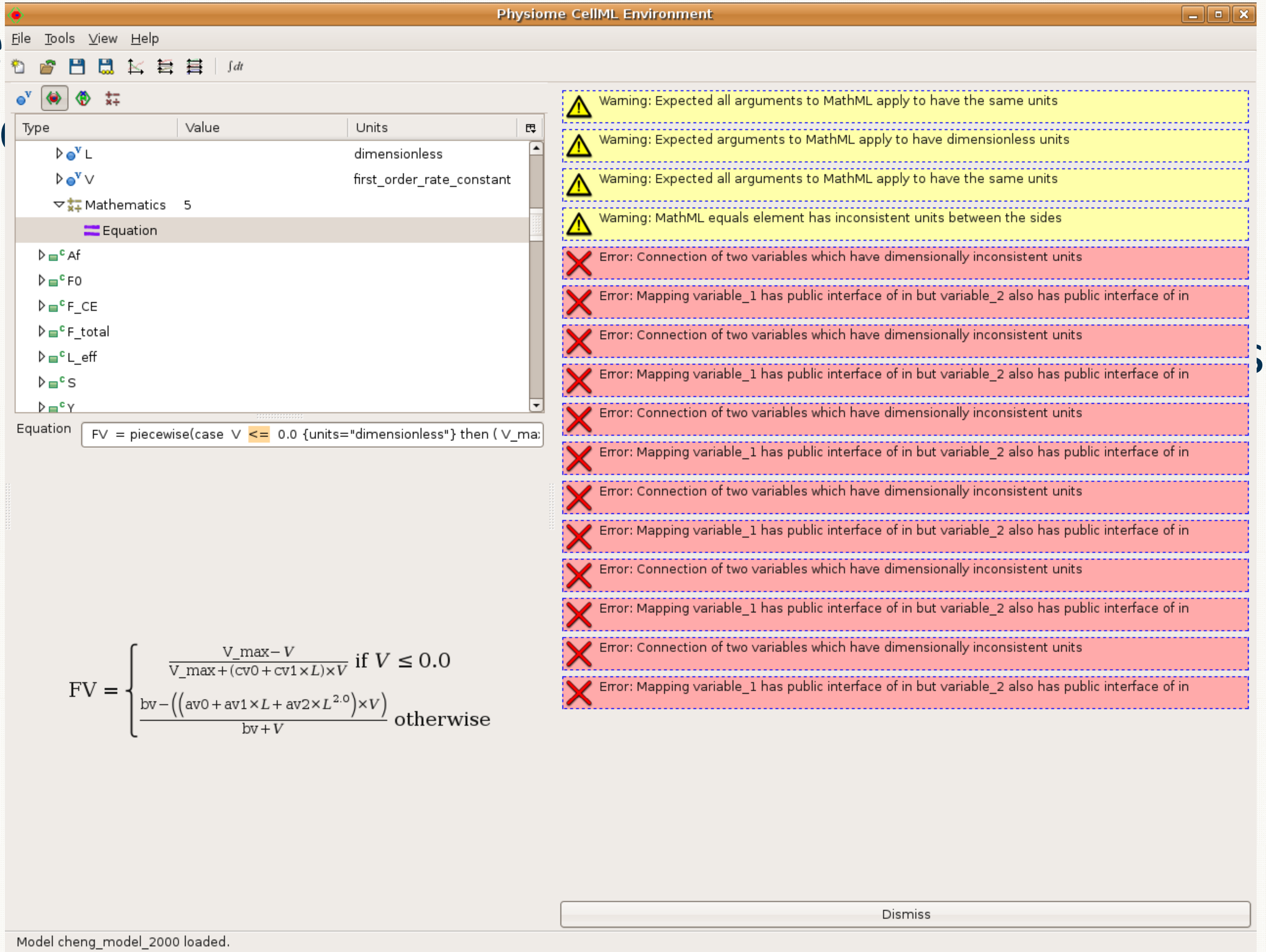

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  - PCEnv 0.5: visual validator, experimental DAE solver; and
  - PCEnv 0.6: export to MATLAB and Python in addition to C (incl. DAE models), as well as Mac OS X support.

PCEnv (II)

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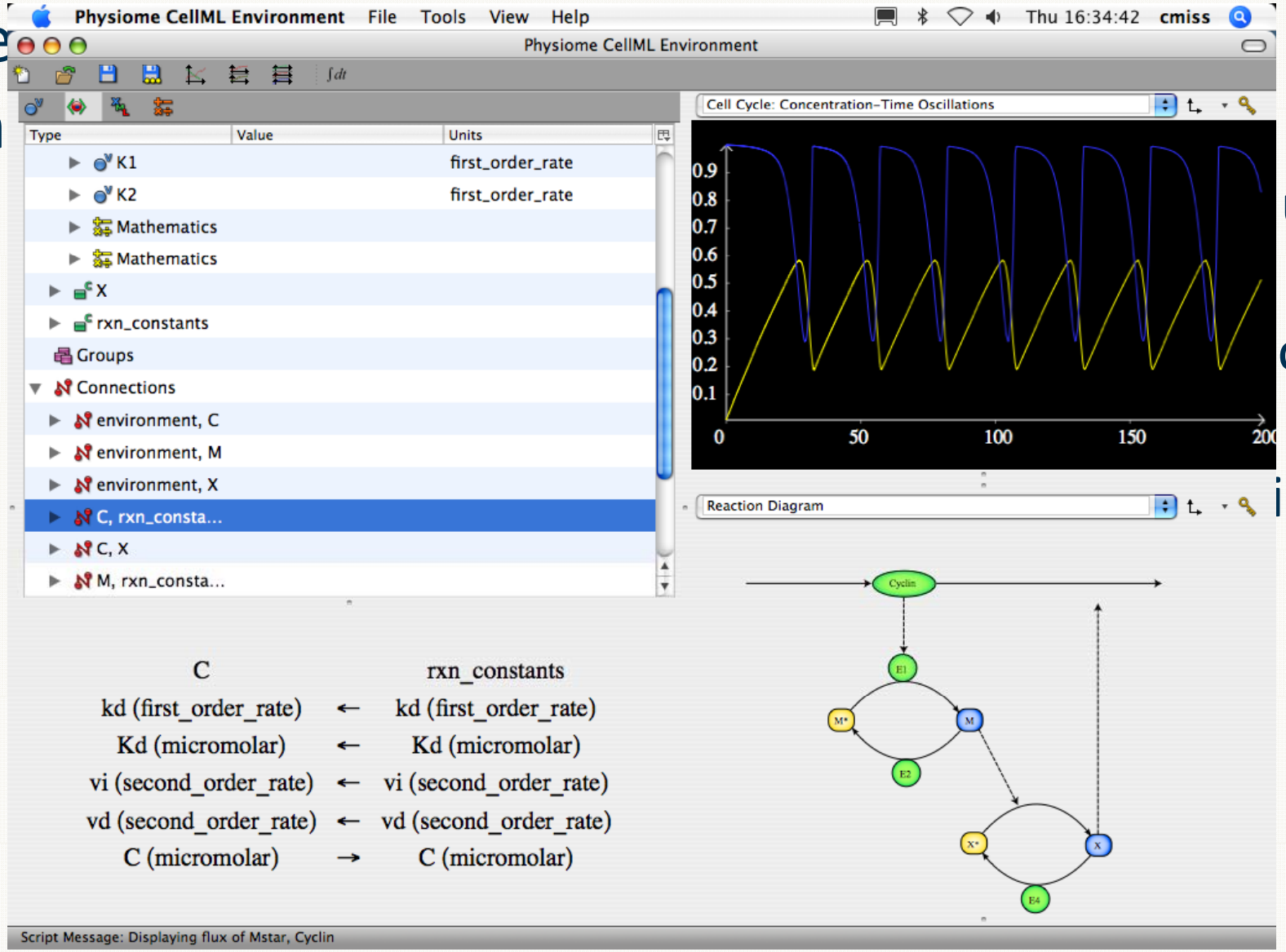
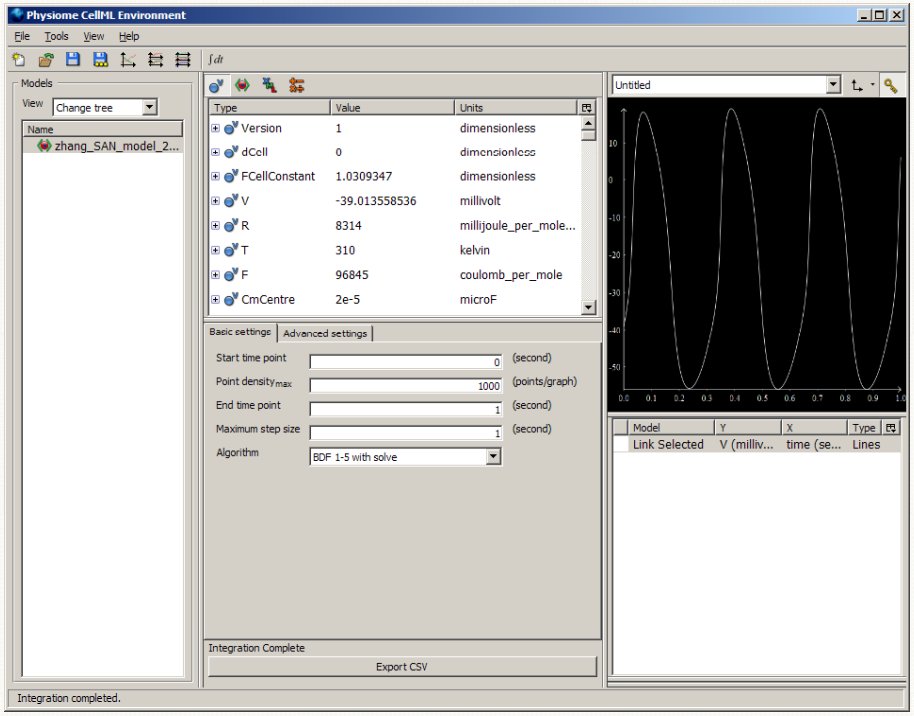
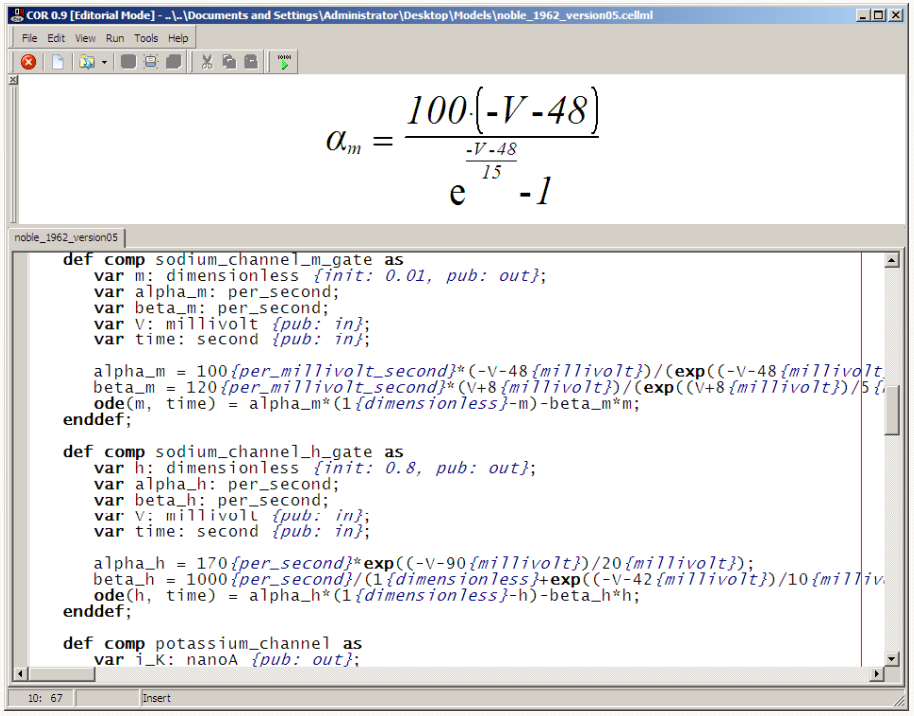


PCENV AND COR

- PCEnv and COR: two CellML environments with similar goals.





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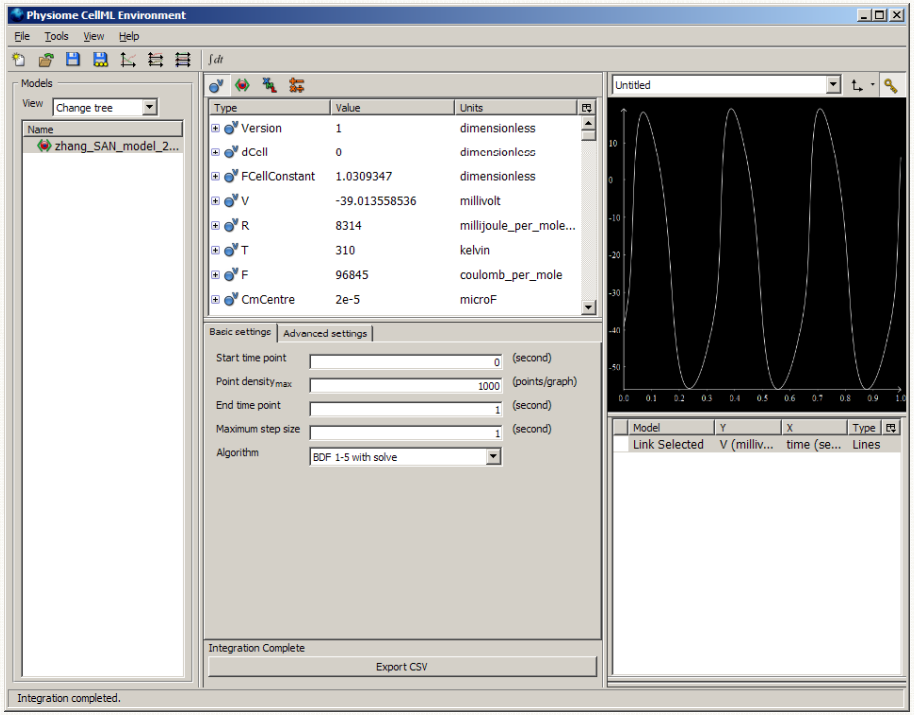

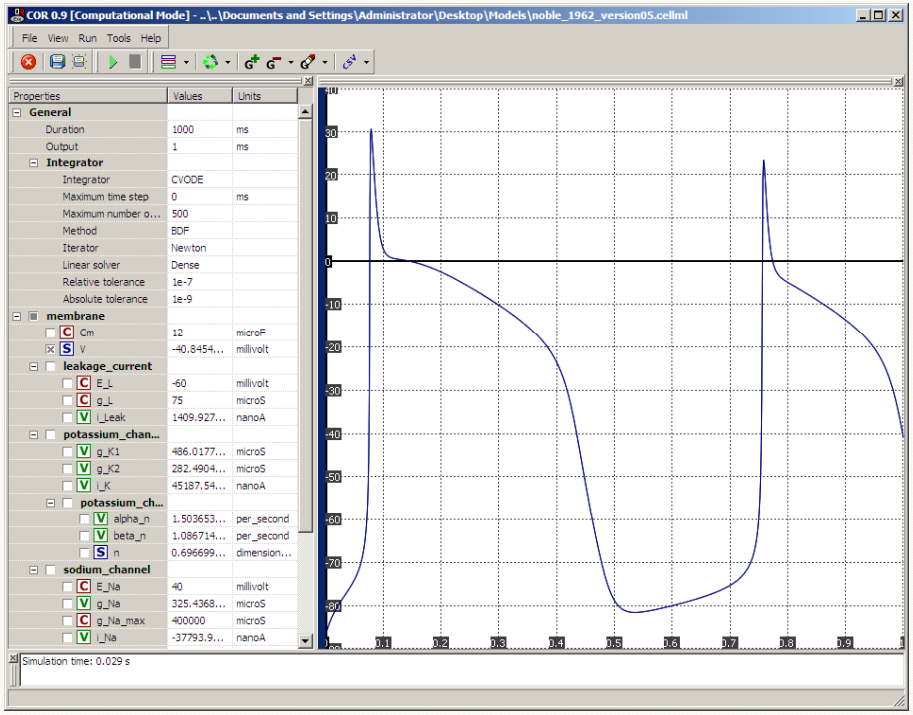

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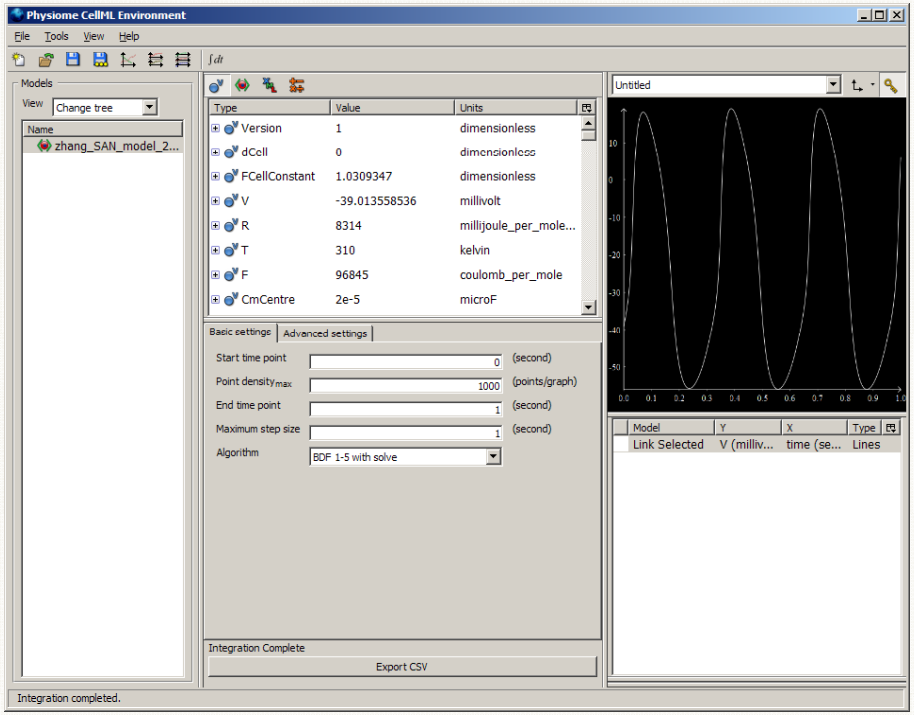

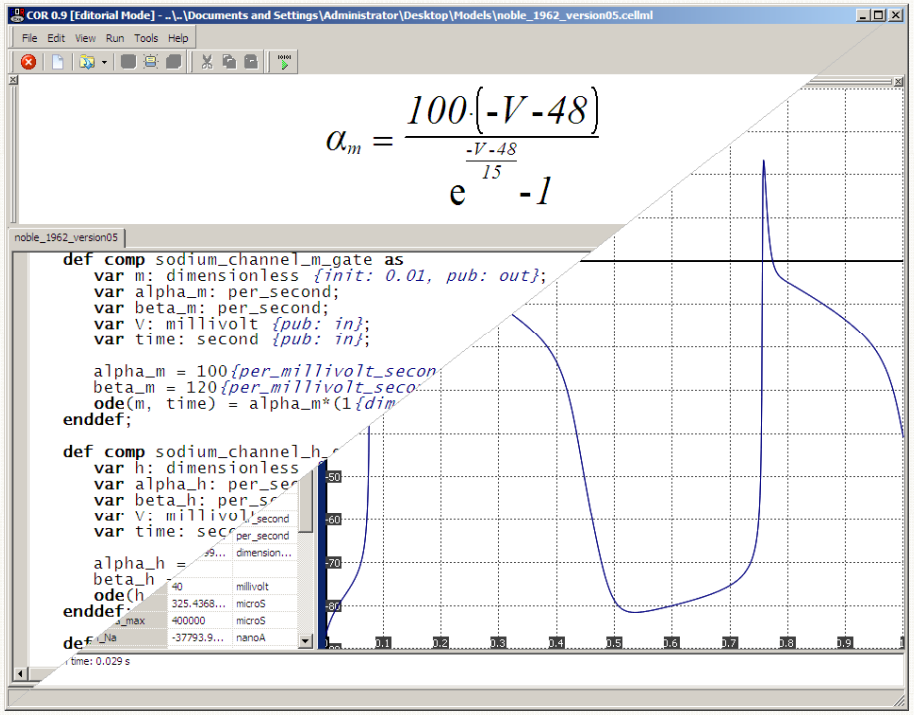

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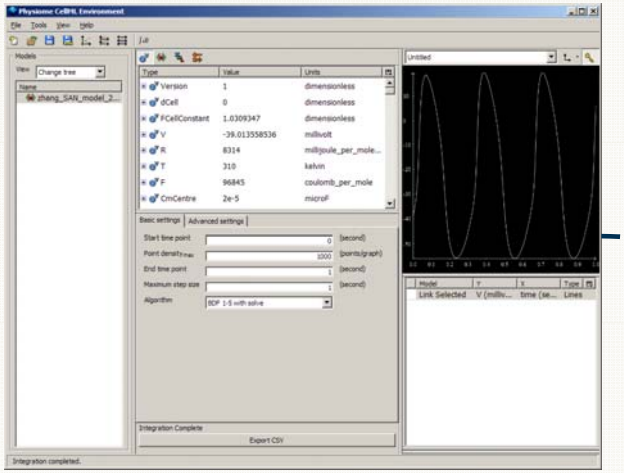
- PCEnv and COR: two CellML environments with similar goals.
- PCEnv's strength is on running simulations, while COR's strength is on editing CellML files.
- The aim is therefore to…



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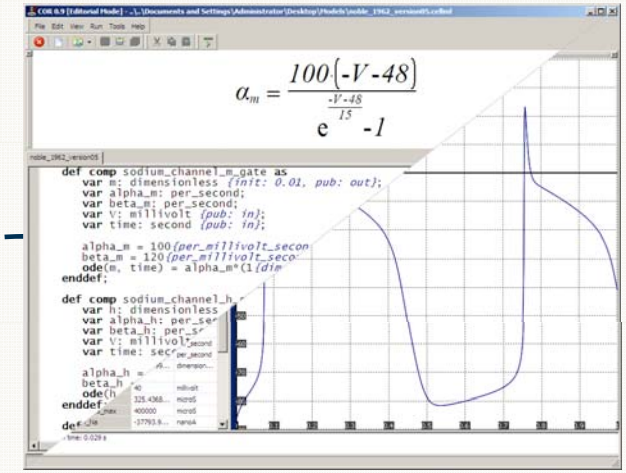
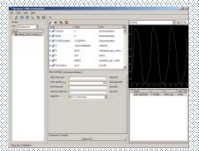


OpenCell



PHILOSOPHY

- A three-step process:
  - Organising;
  - Editing; and
  - Simulating.

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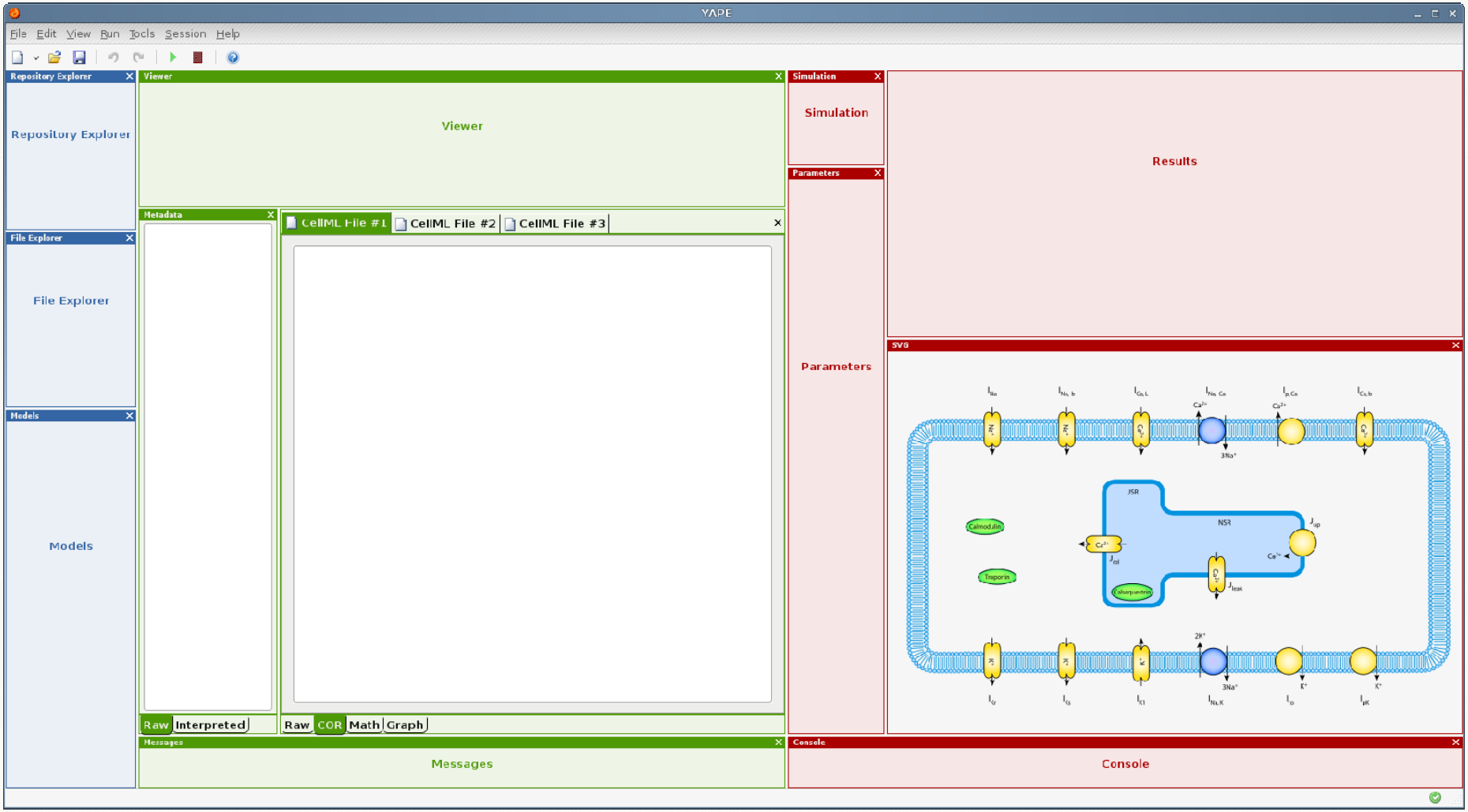

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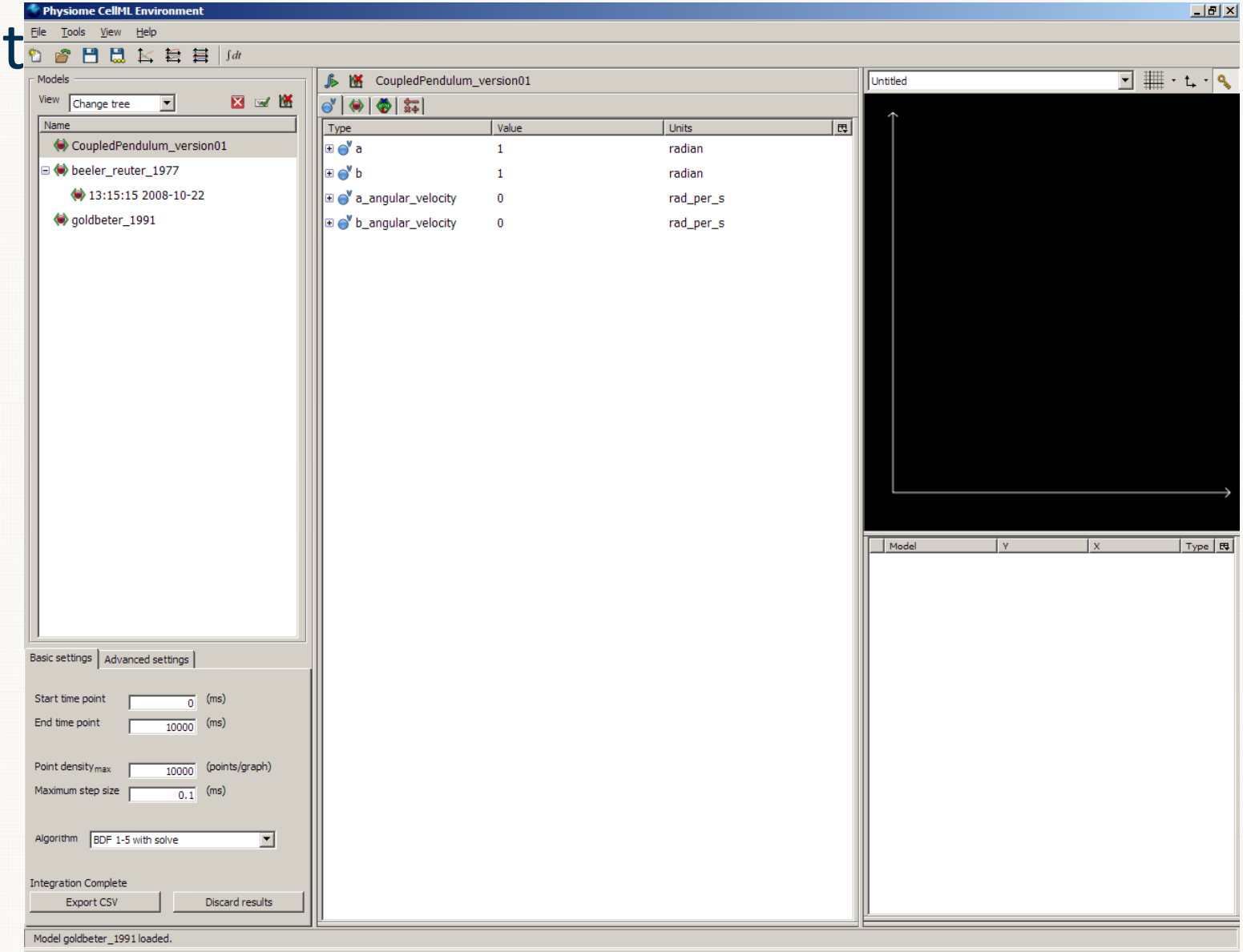

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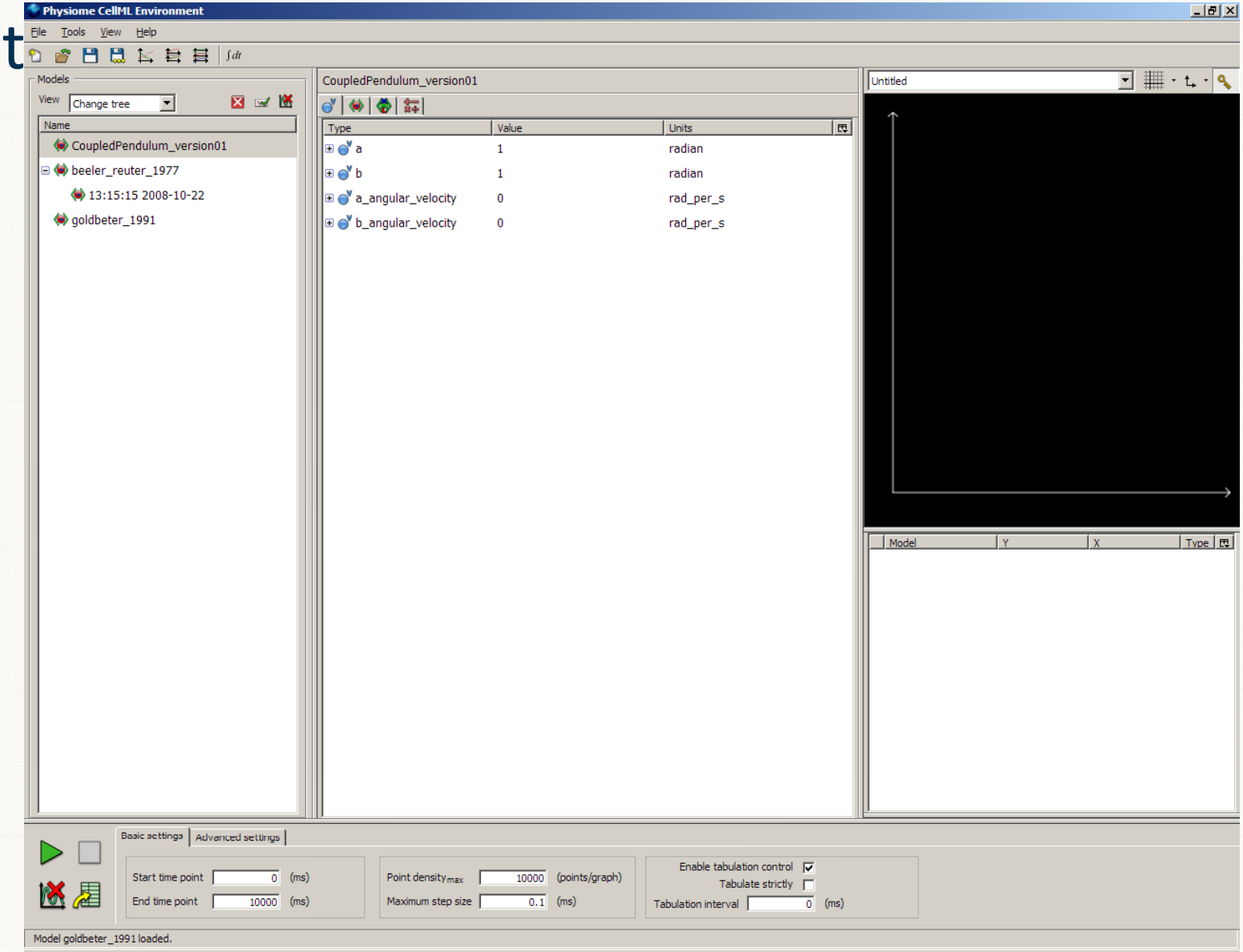

Conclusion

- OpenCell = PCEnv + COR.
- The current priority on this integration of COR with PCEnv is on the editing of CellML files using a COR-like format.
- OpenCell offers inherent support for a wide range of modelling paradigms.
- This does, however, require the involvement of modellers, as well as more people to implement those paradigms.

www.opencellproject.org

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