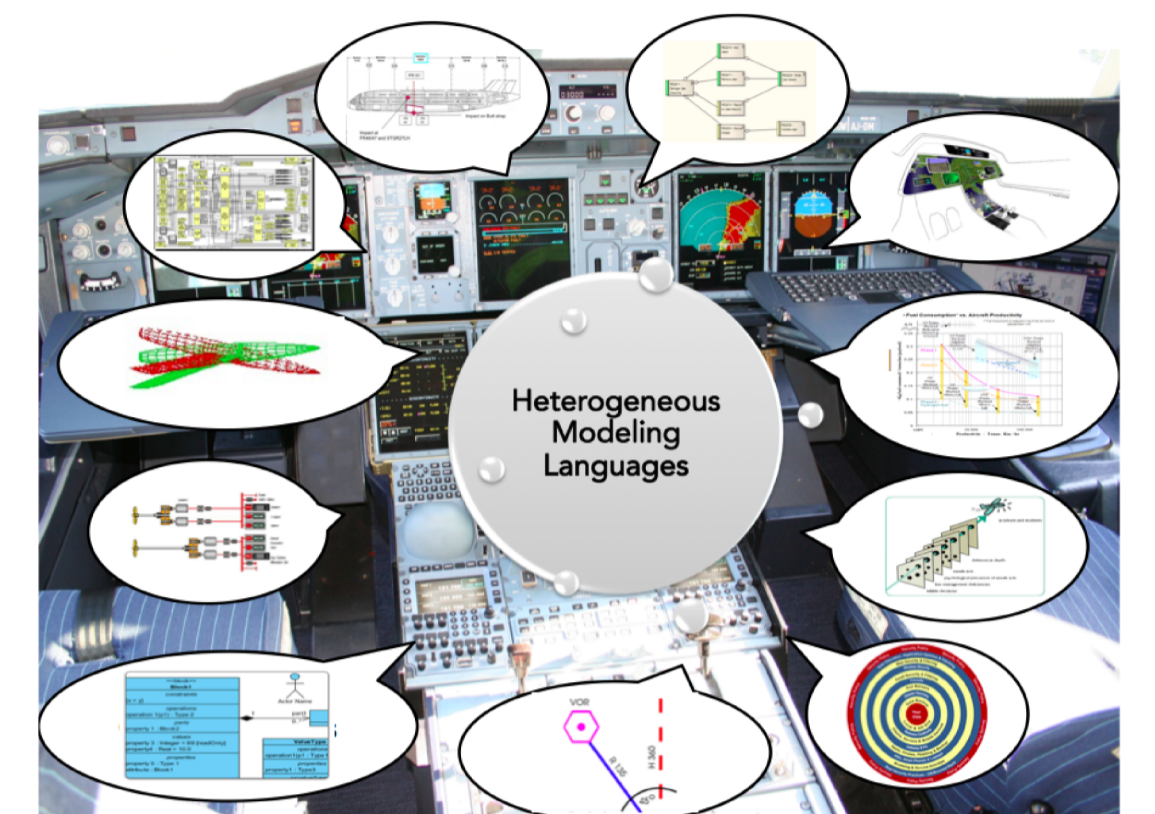


The New Grand Challenge

Supporting Model Heterogeneity in the Development and Runtime Management of Complex Software-Intensive Systems

Coordinating domain-specific modeling languages (DSML) provides **support for language heterogeneity in complex software-intensive systems** development and runtime management (e.g. CPS, SoS, IoT). This **leads to what we call the globalization of modeling languages**, that is, the use of multiple modeling languages to support coordinated development of diverse system aspects.



The ANR GEMOC Project

Objective

Coordination of multiple executable modeling languages to support the coordinated execution of heterogeneous behavioral models

Approach

Bridging the chasm between models of computation and executable metamodeling



Competitiveness clusters

Image & Réseaux, Aerospace Valley and Systematic

Expected outcome

Scientific and technological foundations on modeling language design, implementation and coordination, integrated into the GEMOC studio

The GEMOC Studio

An Eclipse based workbench using modeling technologies dedicated to:



1. Language designers

Language workbench to develop and integrate multiple modeling languages and the associated tooling

Define abstract syntax

- Ecore EMF is used to express the abstract syntax.

Define graphical concrete syntax

- Sirius is used to define graphical editors and animators.

Define semantic actions

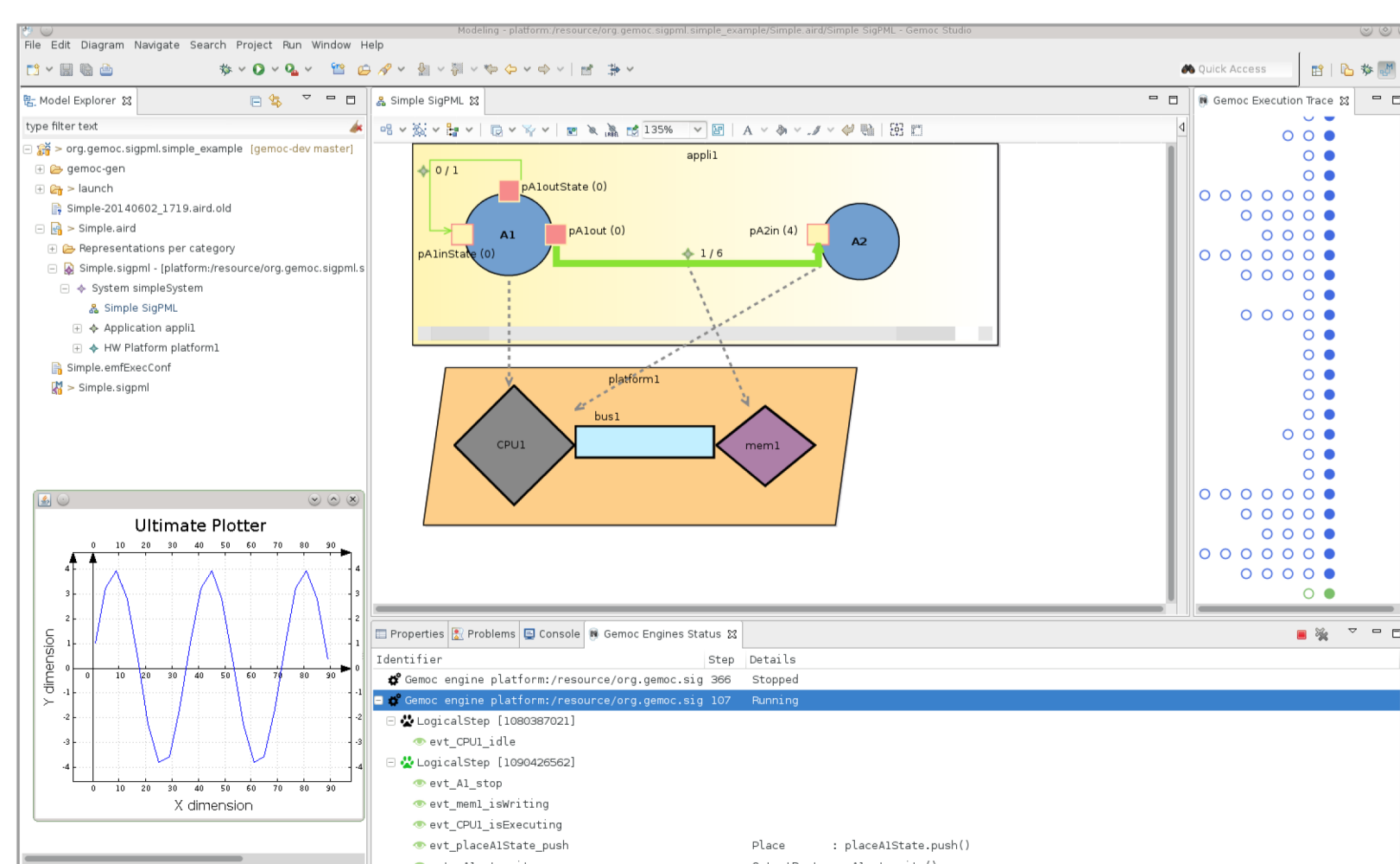
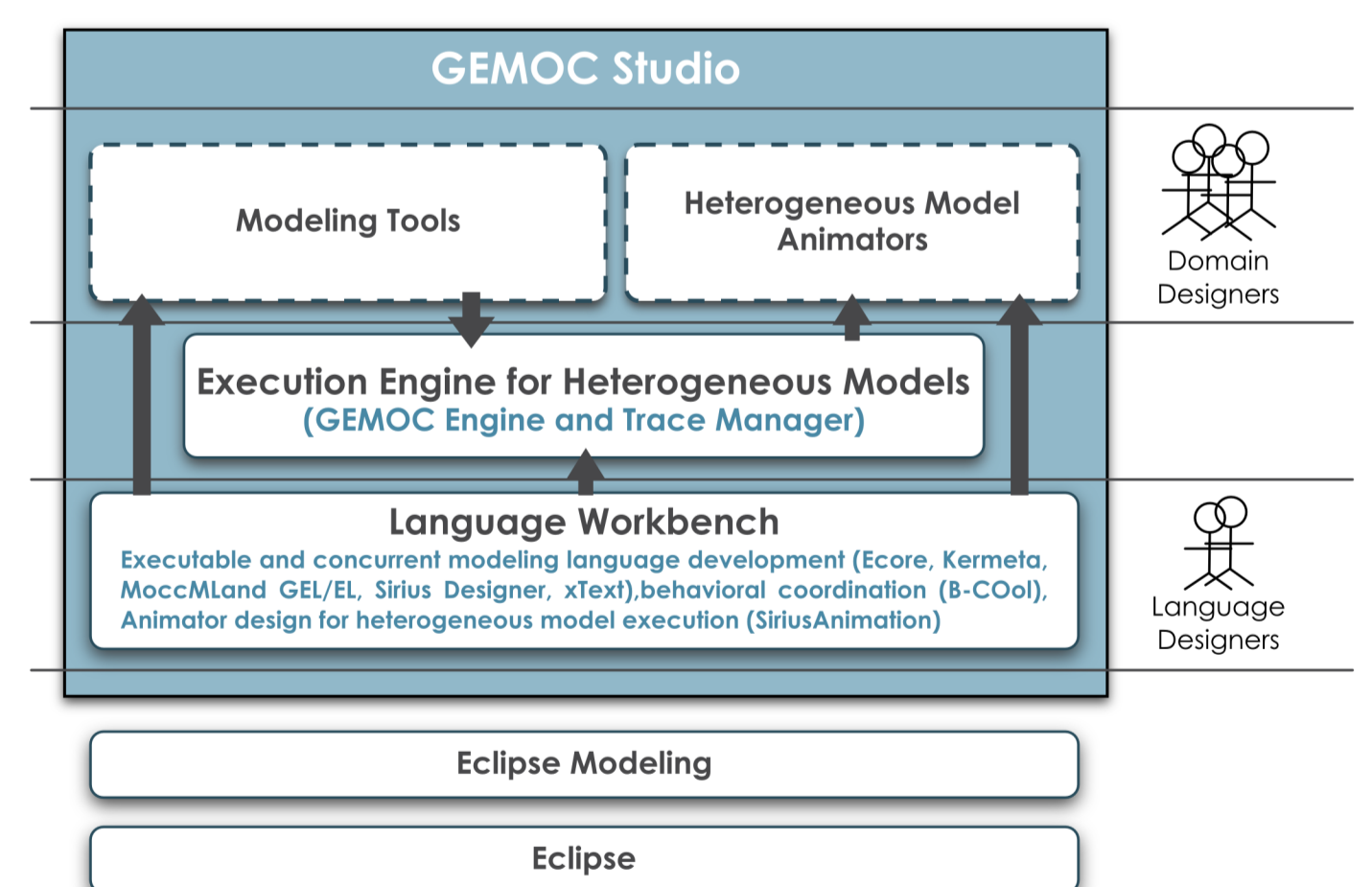
- K3 is based on Xtend and allows model element manipulation as well as aspect weaving.

Define Models of Concurrency and Communication

- MocccML and ECL are used to control the execution of concurrent semantic action by enforcing specific interaction and synchronization rules.

Define behavioral composition operators

- B-Cool is used to express the coordination of the heterogeneous modeling languages.



2. Domain designers

Modeling workbench to create, execute, debug and animate coordinated design models

Designing systems

- Use the newly defined language and tooling to define new heterogeneous models.

Executing and animating heterogeneous models

- GEMOC offers step by step execution that allows fine observation and analysis of all aspects of the system.