



IBPSA Project 1

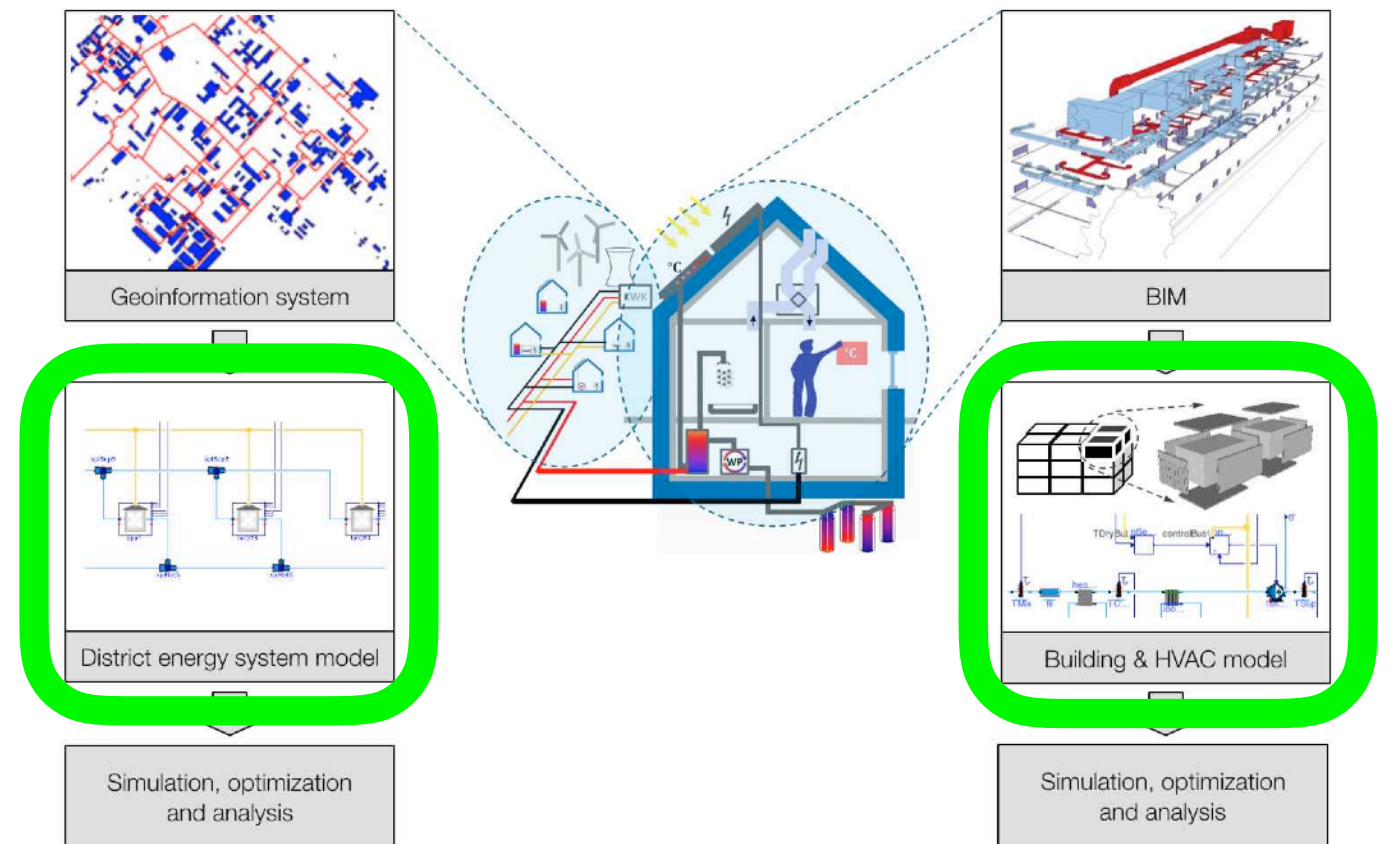
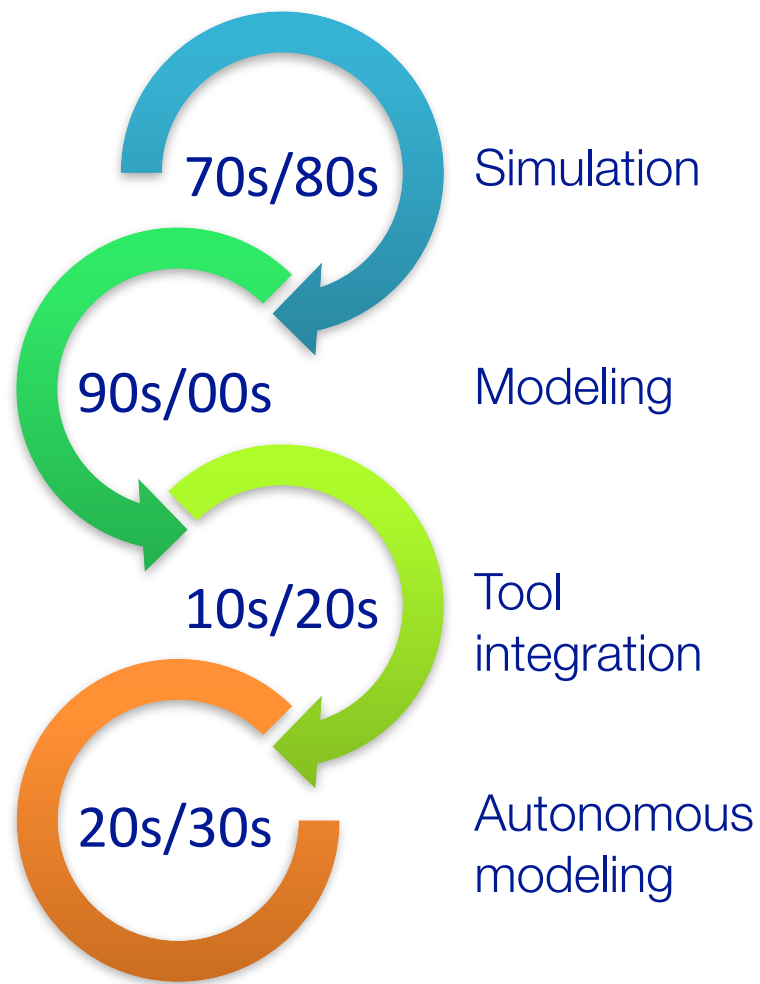
BIM/GIS and Modelica Framework
for
building and community energy system
design and operation

WP 1.1- Modelica Library for Design and Operation

August 31, 2019

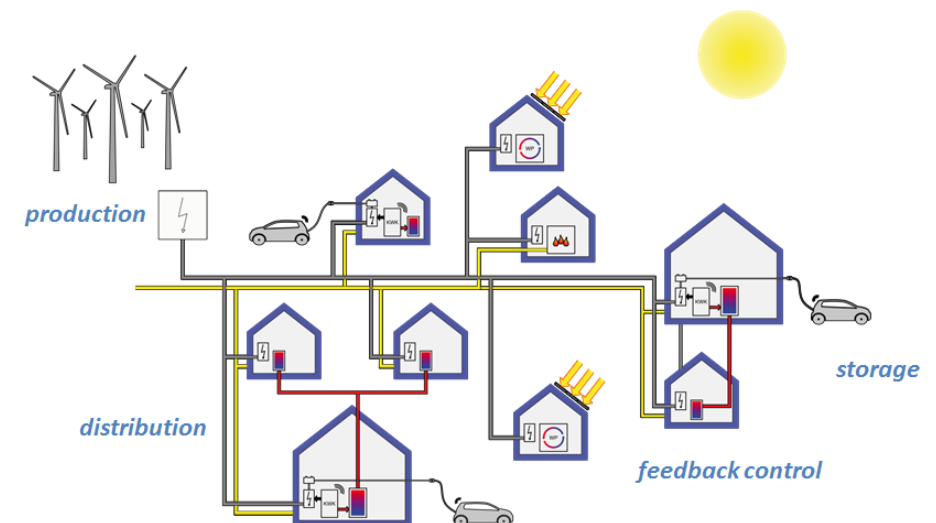
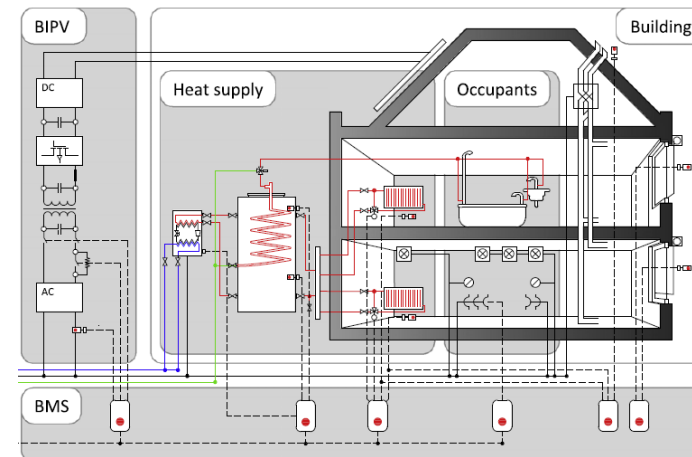
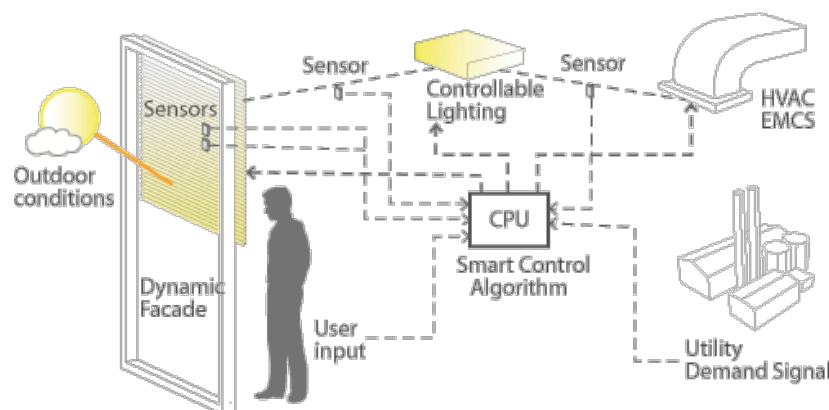
Michael Wetter

Work Package 1.1 Goal



Develop Modelica library applicable for system-level autonomous modeling.

- validated
- well documented
- state-of-the-art physics and dynamics



From controls to buildings and communities 2

Work Package 1.1 Approach

1. Development organized using github.
2. Continuous integration testing, 500 tests for Dymola and JModelica.
3. Workflow and coding guidelines at <https://github.com/ibpsa/modelica-ibpsa/wiki>.
4. Tools to merge to AixLib, Buildings, BuildingSystems and IDEAS libraries.

ibpsa / modelica-ibpsa

Unwatch 29 Star 64 Fork 55

Code Issues 30 Pull requests 5 Projects 0 Wiki Security Insights Settings

Modelica library for building and district energy systems developed within IBPSA Project 1 <https://ibpsa.github.io/project1> Edit

Manage topics

4,689 commits 55 branches 5 releases 30 contributors

Branch: master New pull request Create new file Upload files Find File Clone or download

Mathadon Merge pull request #1195 from ibpsa/issue1194_dryCoilMedium Latest commit b5956e8 6 days ago

IBPSA	Corrected wrong Media that used Buildings instead of IBPSA	7 days ago
bin	Updated runUnitTests.py to be identical to Buildings	8 days ago
.gitignore	Updated gitignore for funnel integration	8 days ago
.travis.yml	Switched to BuildingsPy master	8 days ago
README.md	Updated readme.	2 years ago

README.md

Modelica IBPSA library

This is the development site for the *Modelica IBPSA Library* and its user guide.

Instructions for developers are available on the [wiki](#).

Library description

The Modelica *IBPSA* library is a free open-source library with basic models that codify best practices for the implementation of models for building and community energy and control systems.

The development of the IBPSA library is organized through the IBPSA Project 1 (<https://ibpsa.github.io/project1>) of the International Building Performance Simulation Association (IBPSA). The development was organized from 2012 to 2017 through the Annex 60 project (<http://www.iea-annex60.org>) of the Energy in Buildings and Communities Programme of the International Energy Agency (IEA EBC).

This library is typically not used directly by end-users. Rather, it is integrated by developers of other Modelica libraries for building and community energy systems, who then distribute it to end-users as part of their respective library. Currently, the *IBPSA* library is used as the core of these libraries:

- *AixLib*, from RWTH Aachen University, Germany: <https://github.com/RWTH-EBC/AixLib>
- *Buildings*, from LBNL, Berkeley, CA, USA: <http://simulationresearch.lbl.gov/modelica>
- *BuildingSystems*, from UdK Berlin, Germany: <http://www.modelica-buildingsystems.de>
- *IDEAS* from KU Leuven, Belgium: <https://github.com/open-ideas/IDEAS>

License

The Modelica *IBPSA* library is available under a 3-clause BSD-license. See [Modelica IBPSA Library license](#).

Development and contribution

You may report any issues by using the [Issues](#) button.

Contributions in the form of [Pull Requests](#) are always welcome. Prior to issuing a pull request, make sure your code follows the [style guide and coding conventions](#).

Progress in last half year

BoundaryConditions

- Weather data reader can now read files that
 - do not cover a whole year, such as from November to March
 - span multiple years, even if not starting at January 1

Fluid

- Simplified Sources.Boundary_pT and Boundary_pH
- In progress: Revised pressure independent damper
- In progress: Partially wet coil

Media

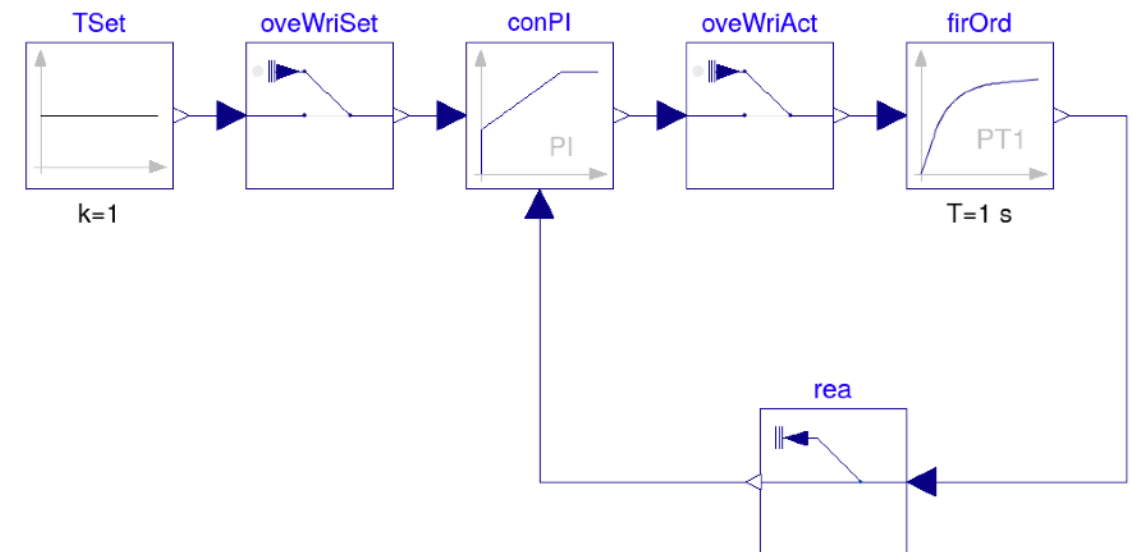
- In progress: Implementation of R134a, R290, R410A, R744, and R32

Utilities.IO

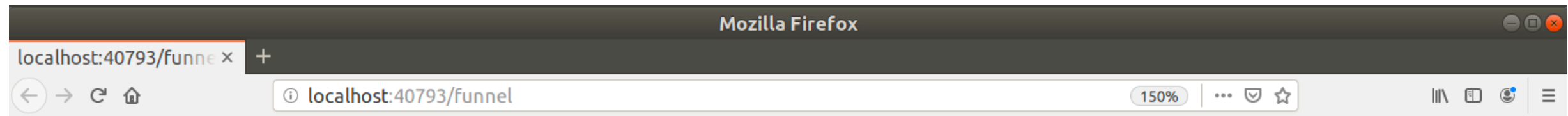
- Overwrite and read block for signal (used by BOPTEST)

General

- Made library compatible to MSL 3.2.3
- Removed old graphical annotations
- Updated regression testing to Dymola 2020
- Reimplemented result comparison in BuildingsPy



New result comparison



Simulation	Translation	Comparison
Show	All	entries
Search: <input type="text"/>		
Model	Variables	Success
IBPSA.Fluid.Actuators.Dampers.Examples.Damper	preIndDpFixed_nominal.m_flow, preInd.m_flow, res.m_flow, preIndFrom_dp.m_flow	75%
IBPSA.Fluid.Actuators.Dampers.Examples.VAVBoxExponential	vav.m_flow, dam.m_flow, vav.dp, dam.dp, res.dp	80%
IBPSA.Fluid.Actuators.Dampers.Examples.MixingBox	mixBox.damExh.m_flow, mixBox.damRec.m_flow, mixBox.damOA.m_flow	100%

Showing 1 to 3 of 3 entries

Previous 1 Next

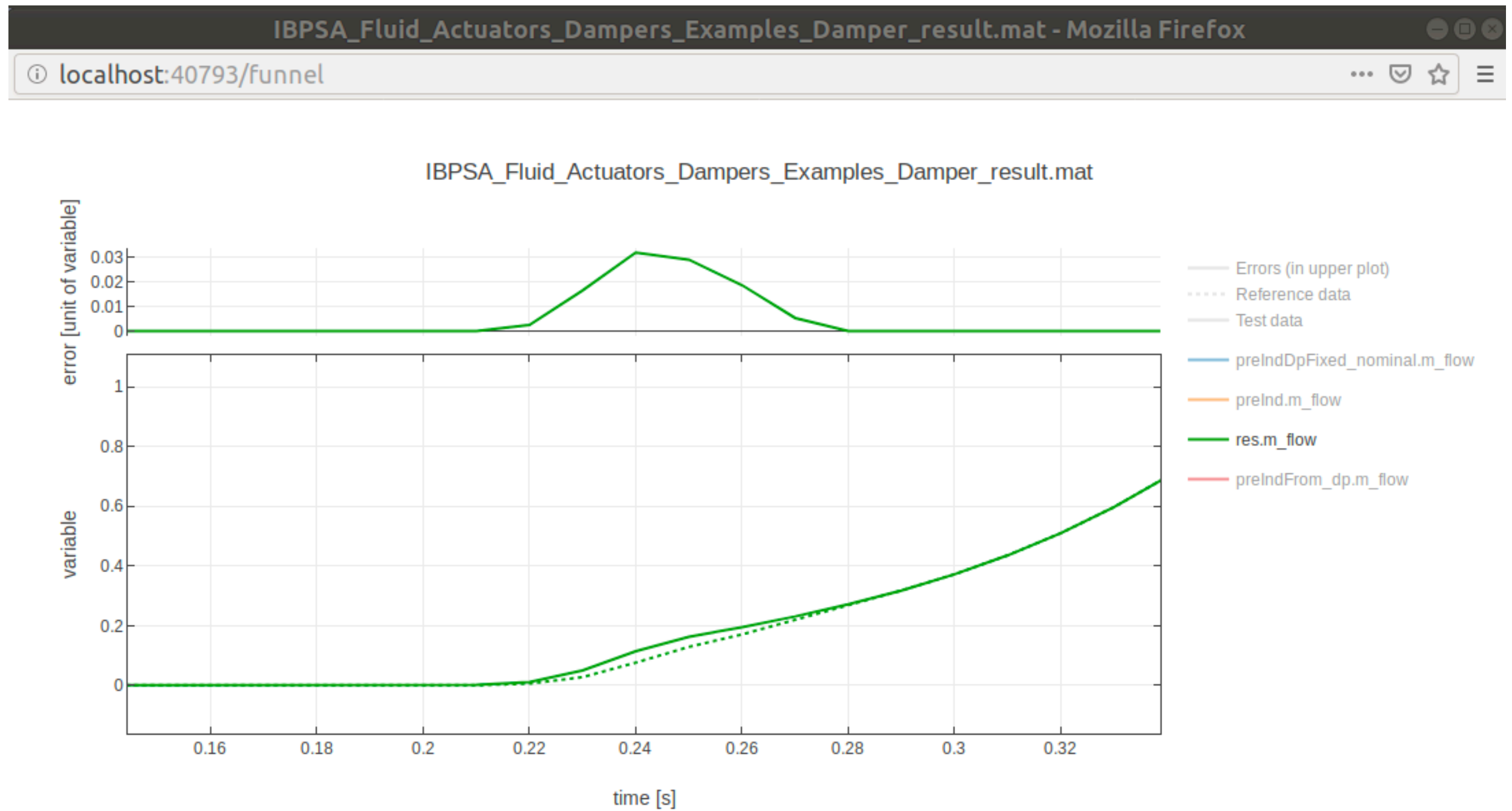
Color Legend

Translation, simulation or extracting simulation results failed: see message in alert box.

Funnel comparison failed: see message in alert box.

Result verification detected error, see plot.

New result comparison



Breakout sessions

Modeling of buildings and networks, including 1000s of buildings (joint with Task 3).

New and upcoming developments of individual libraries.

Heat pump models.

Requirements for result caching for BuildingsPy.

Partially wet coil.

Pressure independent damper.

Refrigerant models.

MPC library (joint with WP 1.2)