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

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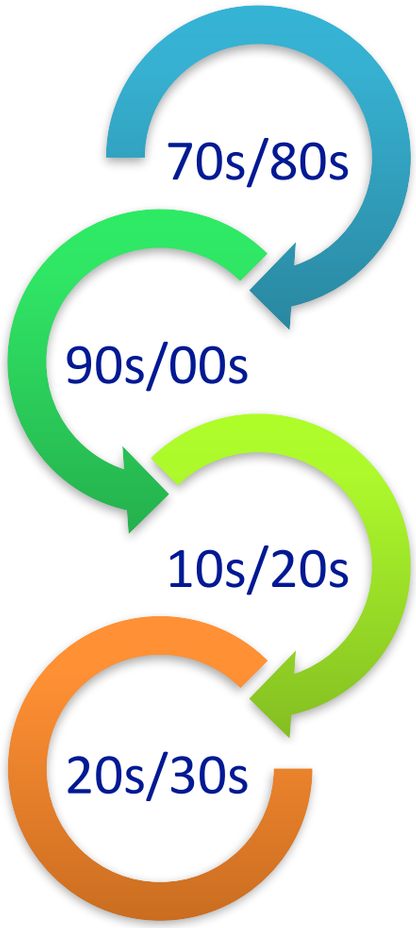
Work Package 1.1 Goal

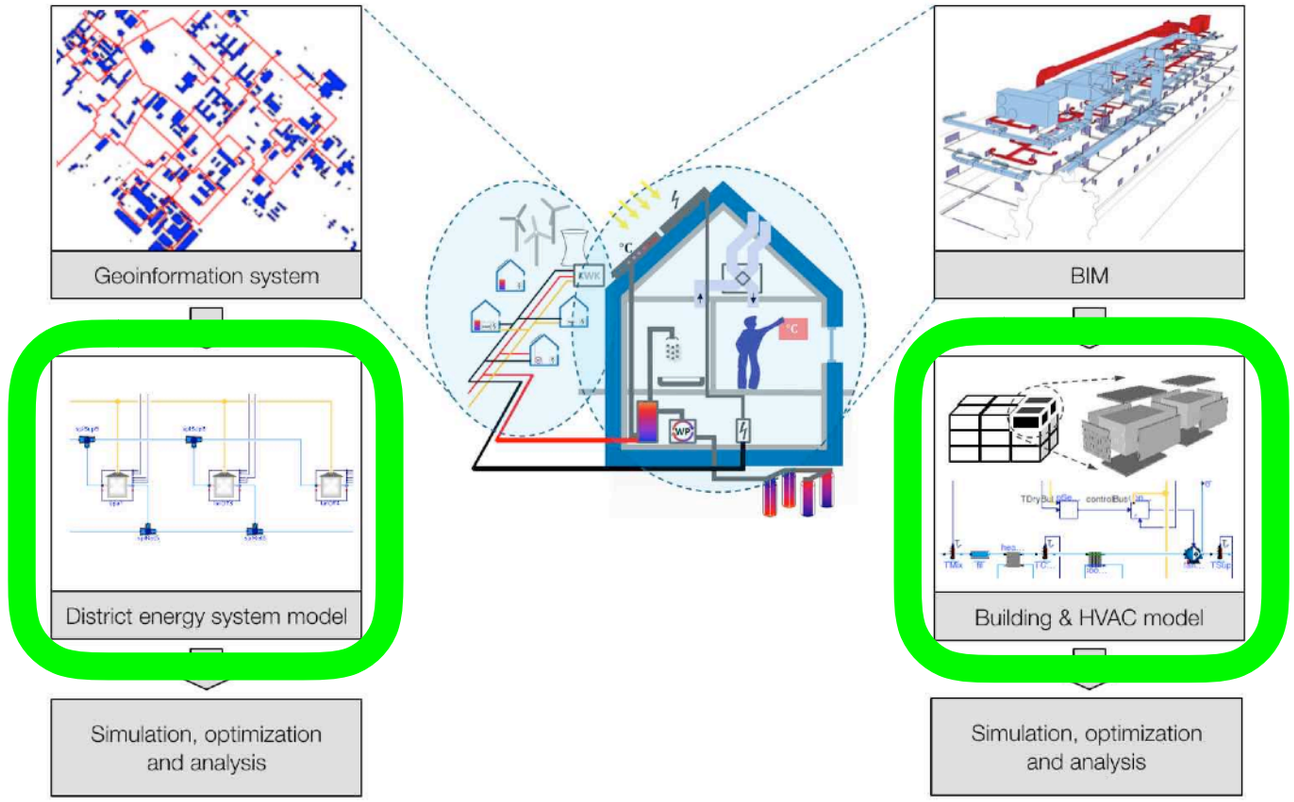


Simulation

Modeling

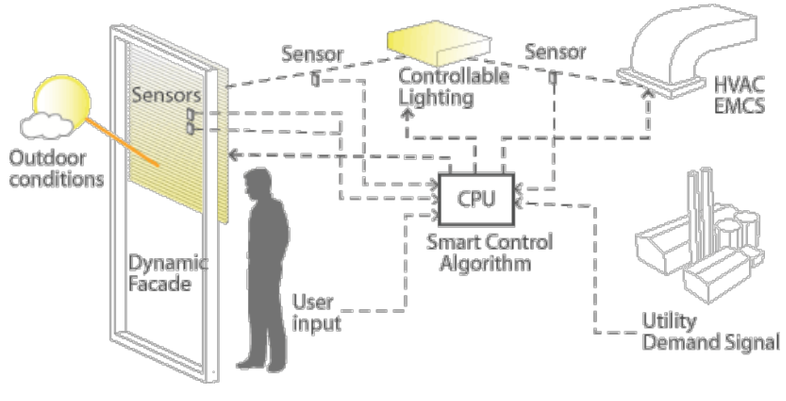
Tool integration

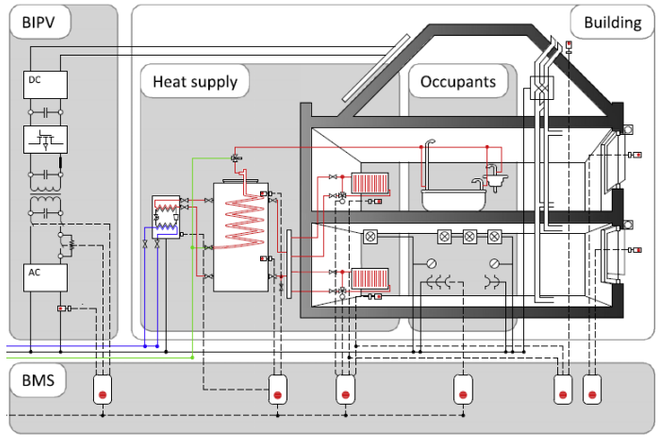
Autonomous modeling

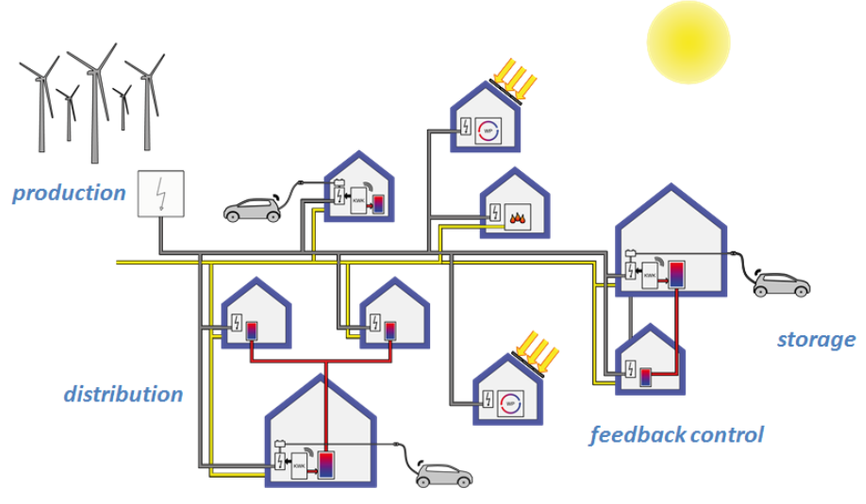


Develop Modelica library applicable for system-level autonomous modeling.

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



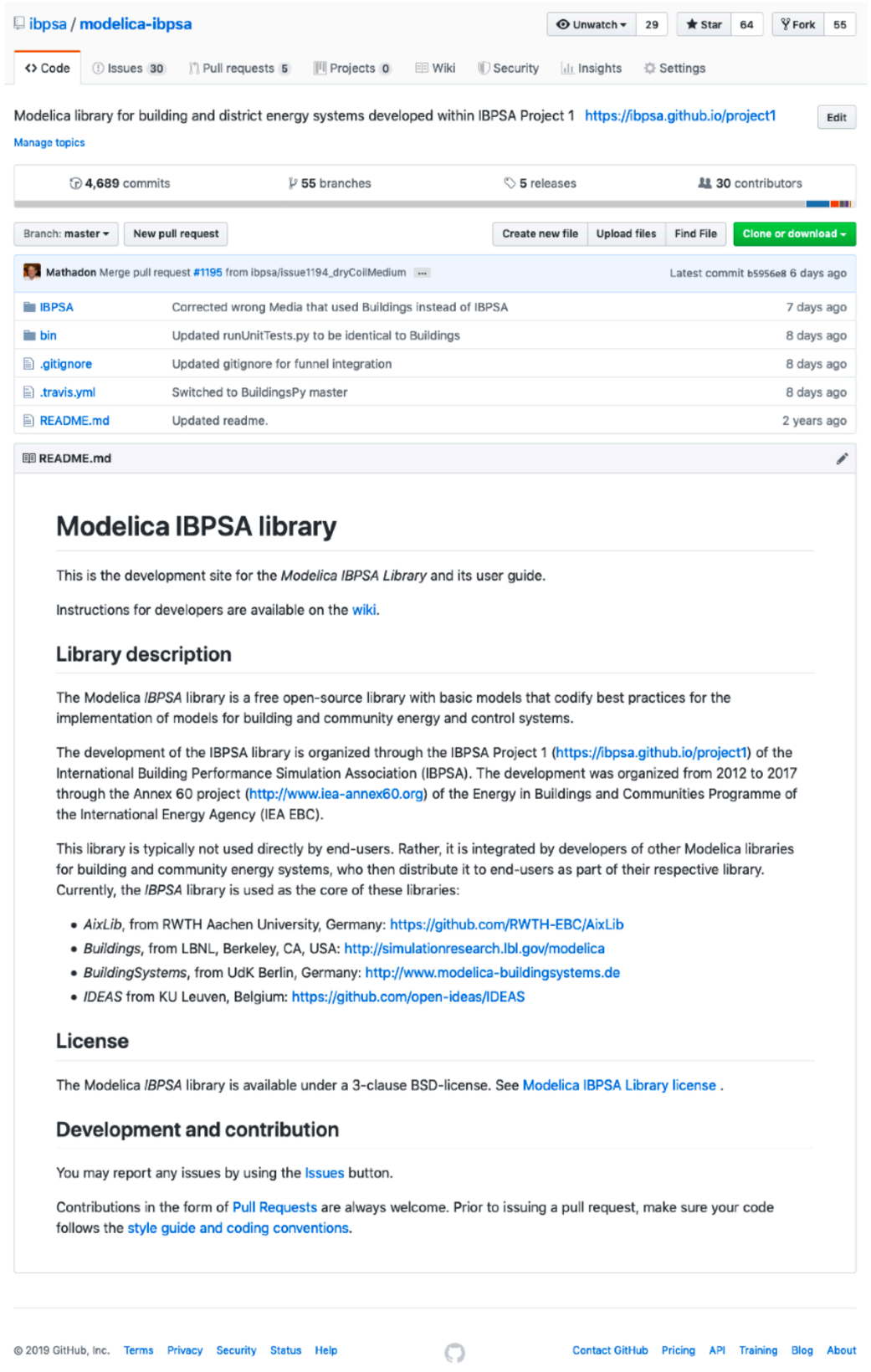




From controls to buildings and communities

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.



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

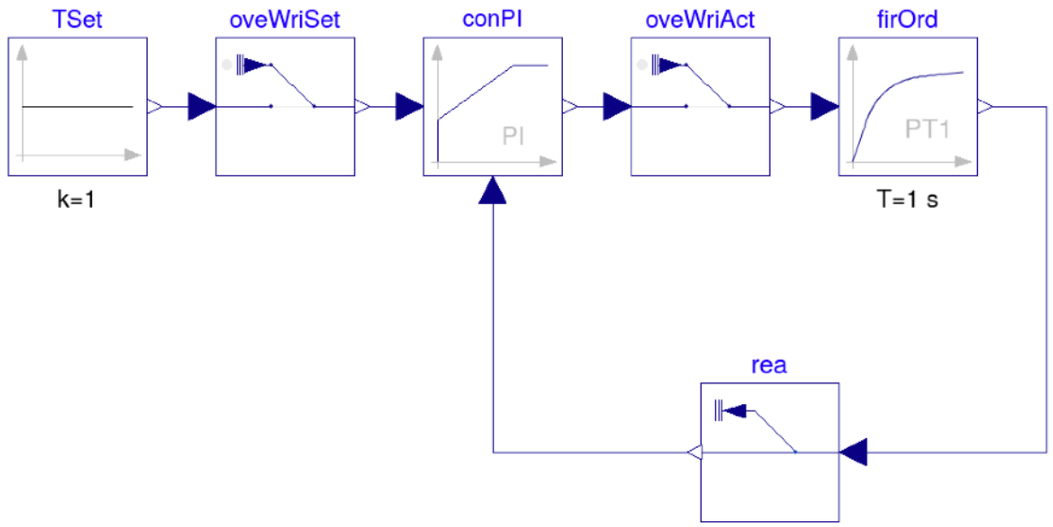
- Simplified Sources.Boundary_pT and Boundary_pH
- In progress: Revised pressure independent damper
- In progress: Partially wet coil

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:

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

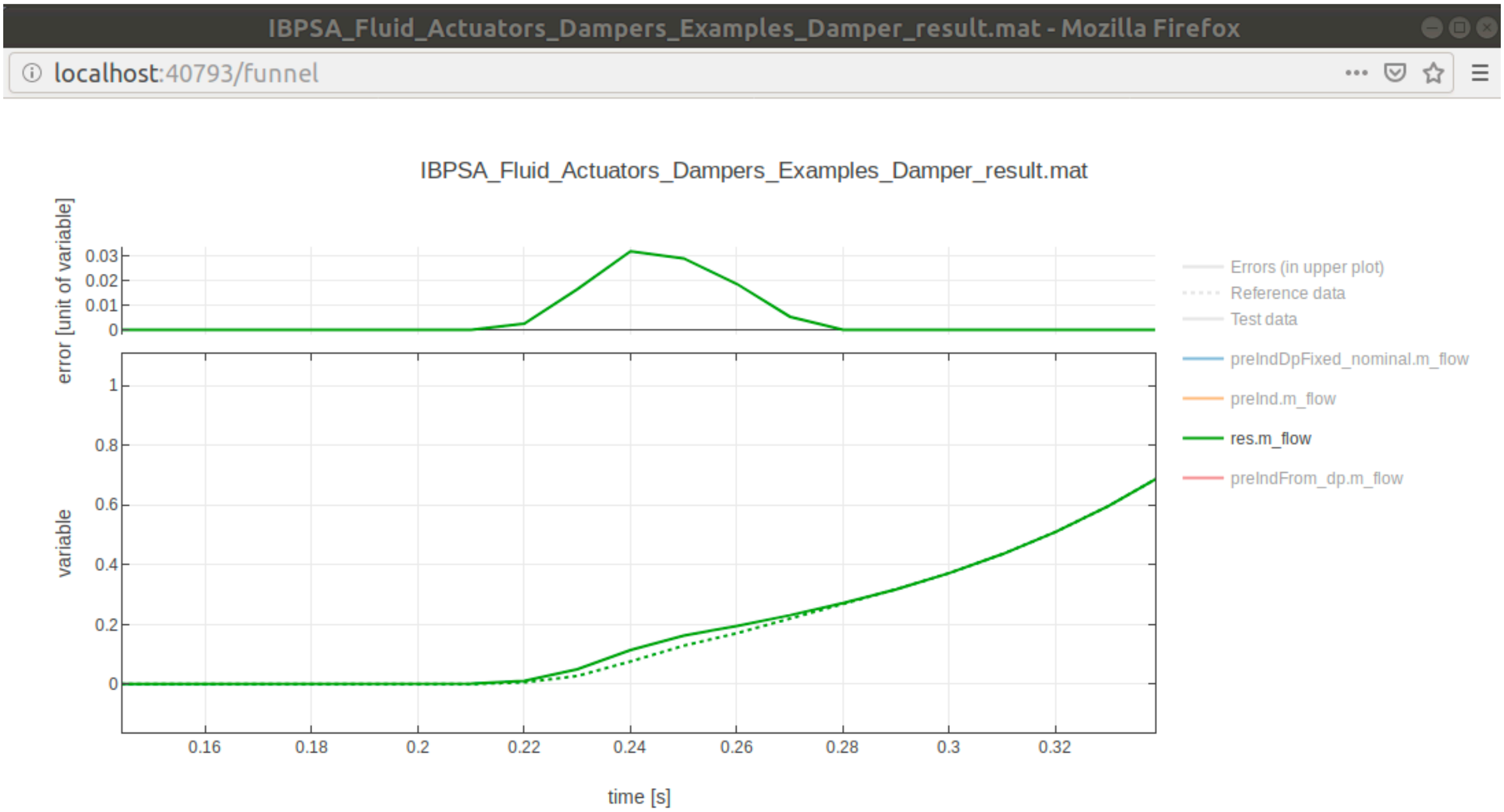
Color Legend

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)