**Linearization of Modelica building envelope models in Dymola**

This file displays an example of the command line-based linearization procedure via linear analysis toolset of the Dymola environment.

For more details read the paper:

D. Picard, F. Jorissen, L. Helsen. Methodology for Obtaining Linear State Space Building Energy Simulation Models. Proceedings of the 11th International Modelica Conference, Versailles, France, September 21-23, 2015

<http://www.ep.liu.se/ecp/118/005/ecp1511851.pdf>

**Linearized building envelope state space model** (obtain file - ssm.mat)**:**

// Modelica building model linearization example

OutputCPUtime:=false;

re=Modelica\_LinearSystems2.ModelAnalysis.Linearize("SpecifyModelicaModel");

path = Modelica.Utilities.Files.loadResource("SpecifyPathToSaveLinearizedModel/");

writeMatrix(fileName=path + "ssm.mat",matrixName="A",matrix=re.A);

writeMatrix(fileName=path + "ssm.mat",matrixName="B",matrix=re.B, append=true);

writeMatrix(fileName=path + "ssm.mat",matrixName="C",matrix=re.C, append=true);

writeMatrix(fileName=path + "ssm.mat",matrixName="D",matrix=re.D, append=true);

Modelica.Utilities.Files.remove(path + "uNames.txt");

for i in 1:size(re.uNames,1) loop Modelica.Utilities.Streams.print(re.uNames[i], path + "uNames.txt"); end for;

Modelica.Utilities.Files.remove(path + "yNames.txt");

for i in 1:size(re.yNames,1) loop Modelica.Utilities.Streams.print(re.yNames[i], path + "yNames.txt"); end for;

Modelica.Utilities.Files.remove(path + "xNames.txt");

for i in 1:size(re.xNames,1) loop Modelica.Utilities.Streams.print(re.xNames[i], path + "xNames.txt"); end for;

OutputCPUtime:=true;

**Precompute disturbances** (obtain file - precomputed.mat)**:**

experimentSetupOutput(inputs=false,outputs=true,auxiliaries=false,equidistant=true,events=false);

savePath = "SpecifyPathToSavePrecomputedDisturbances";

simulateModel("SpecifyModelicaModel", stopTime=400000, numberOfIntervals=0, outputInterval=30, method="Euler", tolerance=1e-006, fixedstepsize=30, resultFile=savePath);