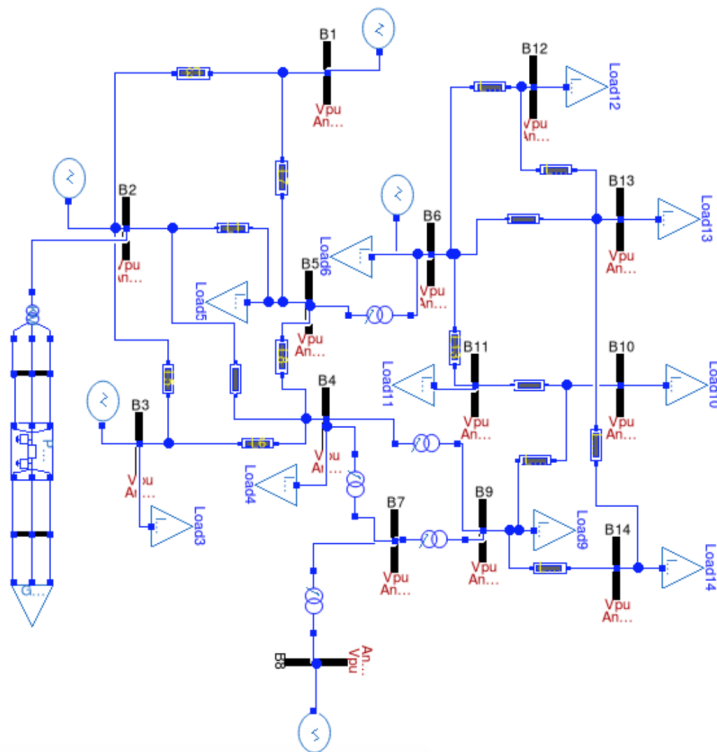


# THE OPEN INSTANCE POWER SYSTEM LIBRARY (OpenIPSL): A MODELICA LIBRARY FOR PHASOR TIME-DOMAIN SIMULATIONS

Marcelo de Castro Fernandes<sup>1</sup>  
 Manuel Navarro Catalán<sup>1</sup> | Luigi Vanfretti<sup>1</sup>

<sup>1</sup>Electrical, Computer, and Systems Engineering Department, Rensselaer Polytechnic Institute, United States of America, {decasm3,navarm2,vanfrl}@rpi.edu

The evolution of power systems simulation shows that tools have always been created in order to assist studies addressing evolving power network requirements. As networks increased in size and complexity, tools were adapted and enhanced to meet the demand for new analysis. Modelica language has many features that make it a promising alternative for modeling complex power grids. In this context, the Open Instance Power System Library, or OpenIPSL, offers a wide set of power system components that are made in Modelica to meet the demand for tools to analyze modern power systems, which are complex cyberphysical networks. The main goal of this library is to provide power system models that can be used for teaching and research. The OpenIPSL can be used for power system dynamic analysis, such as phasor time-domain simulations and it is developed to be used in research and education. This user presentation will give an introduction to the library, illustrating recent modeling developments with sample applications, like the one depicted in Figure 1. In addition, the user presentation will also discuss on-going work, such as automated tests based on continuous integration (CI) software technologies, and the plans for a new release of the library in 2020.



**FIGURE 1.** Interconnection of a small-scale distribution feeder (shown in the left hand side of the figure) to a transmission system modeled with OpenIPSL.