



iPST

iTesla Power System Tools

The open-source project for power grid simulations

Join the iPST session, Thursday 1st June 2017

Comsquare, 57 esplanade du Général de Gaulle, 92081 Paris La Défense, France

The iPST project aims at developing of an open-source platform dedicated to large power grid simulations and security analysis. It is dedicated to :

- ✓ *power system simulations, be they static through Power Flows and Optimal Power Flows or dynamic through dynamic power system simulators;*
- ✓ *power system data-mining thanks to big-data databases that allow storing time-series of power system related data.*

The core of the project is composed of the iIDM (iTesla Internal Data Model) which allows to import,

export and edit power system models. The computation modules are plugged onto this core.



The core also includes computation distribution functionalities based on MPI (Message Passing Interface). The project continues the development done during the iTesla research project.

AGENDA

10:00-10:30: Welcome coffee

10:30-11:10: Short-term grid operation at RTE: present and future

11:10-11:30: Garpur: Insights into a future risk doctrine

11:30-12:30: Ongoing IT developments within the iPST project

12:30-13:45: Lunch

13:45-14:15: iAL, the iTesla Action Language: a DSL and a rule engine dedicated to remedial action simulations.

14:15-15:00: Research results

- First results of iAL applied to curative remedial action simulation in grid security analysis processes.
- Improvements to the worst-case/robust approach applied to grid security analysis developed within the FP7 project.
- 3D (P,Q,V) diagrams of Eurostag generator models: a step towards online dynamic security analysis.
- Improvement to the FEA model of injection uncertainties

15:00-15:30: Pause

15:30-16:00: Modelica library and dynamic simulators

16:00-16:30: The 2017-2018 development roadmap and conclusion

FREE REGISTRATION: <https://goo.gl/forms/KxB7BKnyglRQmmlq2>

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Zoom on some key features of the platform

Import/export

The platform is based on a computationally friendly data format named iIDM (iTesla Internal Data Model) which is oriented towards helping the connection of computation modules. The iIDM supports node/breaker and bus/branch models and the platform involves functionalities to switch from node/breaker to bus/branch view.

The platform is currently able to read CIM V14, UCTE, and iIDM-XML formats. It is able to export grid data into Eurostag format, tabular format and iIDM-XML format. CIM CGMES importer and exporter will be developed soon.

Computation

The platform includes a load-flow interface in order to accommodate for different load-flows. Currently, AIA's HELM and RTE's Hades are available. On top of that, a Monte-Carlo like security analysis process, allowing to simulate contingencies in an uncertain environment through is available.

It is also possible to call dynamic simulators like Eurostag and the iPSL full modelica simulator.

The underlying MPI framework allows the distribution of the computations on as many computers as needed.

JOIN THE OPEN SOURCE PROJECT on GITHUB

Part of the IPST software, as well as the Modelica power system library have been released under the Mozilla Public License 2.0 and can be downloaded at:
<https://github.com/itesla/ipst>

The license is "commercial friendly" and allows a smooth interleaving of open-source and commercial code.

IPST project fact sheet

10 partners

1 open source repository



<https://github.com/itesla>

1 TSO



6 industrials



3 research centers

Imperial College
London



More project results on:
www.itesla-pst.org/