Computer Models for Fire and Smoke

Model Name: PyroSim

Version: 2010.1

Date: 7/12/2010

Classification: Field Model / Miscellaneous

Very Short Description: Graphical User Interface 'GUI' wrapping the NIST Fire Dynamics Simulator (FDS)

Modeler(s), Organization(s): Thunderhead Engineering Consultants, Inc.

User's Guide: http://www.thunderheadeng.com/pyrosim/manual/pdf/PyroSimManual.pdf

and

http://www.thunderheadeng.com/pyrosim/documentation.html

Technical References: Same as Above

Validation References: Same as Above

Availability: http://www.pyrosim.com

Price: http://www.thunderheadeng.com/pyrosim/pricing.html
https://www.thunderheadeng.com/pyrosim/distributors.html

Necessary Hardware: PyroSim is designed to run on MS Window operating systems. Apple users have reported success using PyroSim with both VMWare Fusion and Parallels.

Computer Language: Java & C++

Size: -----

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Detailed Description:

PyroSim is a graphical user interface for the Fire Dynamics Simulator (FDS). It is used to create fire simulations that accurately predict smoke movement, temperature, and toxin concentrations during a fire.

To see some real-world examples of PyroSim in action, please visit the PyroSim Gallery.

To see where PyroSim is being used around the world, you can view our Sales Map.

Key Features

- Edit geometry using floor plan images, angled walls, and other powerful tools.
- Integrated execution of FDS and Smokeview
- Full support for 64-bit operating systems
- Run multi-CPU simulations with a single click
- Import existing FDS4 and FDS5 models.
- Convert FDS4 input files to FDS5
- Import AutoCAD DXF models directly or as background images.

Download the Feature Slideshow to learn more about PyroSim's capabilities.

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Bigger Models with PyroSim 64-Bit Edition

As of PyroSim 2008.2, registered users can take advantage of 64-bit hardware using a 64-bit version of PyroSim. The key simulation components (PyroSim, MPI, FDS) of this version are provided as 64-bit software. This allows access to memory beyond the traditional 3 GB limit in Windows operating systems - making it possible to create fire models with many more cells than with a 32-bit system. The 64-bit version requires a 64-bit computer and operating system.

Verification and Validation

The developers of FDS at the National Institute of Standards and Technology (NIST) use the model verification techniques outlined in ASTME 1355 to ensure the accuracy of the numerical solutions given by FDS. Additional information can be found in Part III of the FDS Users Guide.

FDS was also the subject of a verification and validation study sponsored by the US Nuclear Regulatory Commission and the Electric Power Research Institute. This work compares 5 different simulators based on several fire scenarios.

Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications (NUREG-1824, Vols 1-7)