Synopsys RSoft 2015.06 Release Streamlines Design of Photonic Devices, Photonic Circuits and Fiber Optic Systems

Latest Release Delivers Advanced FDTD Simulation Features and Significant Speed Improvements

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Highlights:

- Enhanced RSoft™ FullWAVE™ finite-difference time-domain (FDTD) simulations simplify and speed the design of LCDs, surface plasmonics and metamaterials
- New features in The RSoft CAD Environment™ make design creation and management faster and easier
- New IMEC foundry component libraries and DSP algorithms accelerate the design of photonic chips, modulator circuits and coherent transceivers
- Innovative new platform for modeling large-core multimode fibers

Synopsys, Inc. (Nasdaq: SNPS) today announced the release of version 2015.06 of the RSoft product portfolio, the company's industry-leading family of software tools for photonic component and optical communication system design. The RSoft Photonic Component Design Suite delivers advanced finite-difference time-domain (FDTD) simulation features as well as significant speed and usability improvements. The RSoft Photonic System Design Suite includes new libraries of components and algorithms to streamline the design of photonic chips, modulator circuits and coherent transceivers, as well as an innovative new platform for modeling large-core multimode fibers. The enhancements in version 2015.06 facilitate faster, more efficient design of a wide range of current and emerging photonic devices, photonic circuits and fiber-based applications.

"The updated RSoft Photonic Component Design Suite helps designers model photonic devices with greater efficiency, accuracy and flexibility. For example, advanced modeling capabilities in FullWAVE simplify the design of photonic nanostructures used in LCDs," said George Bayz, vice president and general manager of Synopsys' Optical Solutions Group. "In addition, new capabilities in the RSoft Photonic System Design Suite provide realistic feedback to help identify opportunities to improve the performance of optical communication systems and photonic circuits early in the product development stages."

RSoft Photonic Component Design Suite

New features include:

- FullWAVE FDTD simulations can now contain both anisotropic and dispersive materials. This provides designers with highly accurate simulations of photonic structures that contain metals and other materials with complex dispersion characteristics, such as twisted nematic crystals used in LCDs, surface plasmonics and metamaterials.
- New FullWAVE options to arbitrarily rotate and vary the crystal axes of anisotropic materials simplify the simulation of LCDs containing multiple anisotropic layers at different orientations.
- Increased efficiency of FullWAVE simulations when used on multi-CPU computers yields speed increases of up to 3X.
- The Arrayed Waveguide Grating (AWG) Utility has been updated with ease-of-use improvements, greater flexibility, and support for silicon-based AWGs.
- Updated Bidirectional Scattering Distribution Function (BSDF) capabilities include a graphical user interface for the calculation of BSDF files and improved handling of dispersion by the RSoft BSDF User Defined Optical Property (UDOP) interface for use with Synopsys' LightTools® illumination design software. RSoft BSDF capabilities provide a highly accurate method for modeling an optical surface's scattering properties and help designers achieve stringent size, weight and cost targets.
- New features in The RSoft CAD Environment™ help make design creation and management faster and easier, especially when working with multiple design files.

RSoft Photonic System Design Suite

New features include:

- In the OptSim™ Circuit tool, IMEC foundry process design kits (PDKs) help photonic chip designers incorporate foundry-specific components into their circuit designs, bringing them closer to the foundry process ecosystem. In addition, new traveling wave Mach-Zehnder modulator circuit components provide designers with an insight into complex bidirectional optical and RF signal interactions.
- In the OptSim tool, a MATLAB library of digital signal processing (DSP) algorithms for coherent transceivers gives designers flexibility to pick and choose from the supplied library of DSP algorithms, make changes, or incorporate their

own algorithms and evaluate system performance.
- In the ModeSYS™ tool, modeling of large-core step-index multimode fibers based on the Gloge power-flow approach provides a more efficient approach to modeling large-core (200 microns and larger) multimode fibers and analyzing encircled angular flux (EAF).

"In the silicon photonics multi-project wafer (MPW) ecosystem, getting the design right the first time is critical because of the cost of manufacturing and testing," said Dr. Amit Khanna, research engineer responsible for silicon photonics PDK development and MPW shuttle runs at IMEC. "The PDKs provide a library of proven and reusable components that effectively assist in the design stage. As the complexity of photonic chips increases, design tools will be invaluable for enhancing functionality and avoiding errors. We are pleased to be actively working with Synopsys in supporting our Silicon Photonic PDK in their photonic circuit design tool OptSim Circuit."

"When modeling large-core multimode fibers commonly used in Advanced Driver Assist Systems (ADAS) in automobiles, conventional methods and radial mode solvers require exorbitantly large computational power," said Dr. Manabu Kagami, Principal Researcher, Information & Communication Research Division, Toyota Central R&D Labs., Inc. "Being able to model these communication systems efficiently makes all the difference for a successful product launch. We closely collaborated with the RSoft team at Synopsys during their development of the Gloge power-flow-based approach in RSoft ModeSYS, which provides an accurate, efficient platform for modeling large-core fibers. We have seen close correlation between the ModeSYS simulation results and our laboratory measurements. ModeSYS will help us develop new ADAS solutions and get them to market faster."

Availability & Resources

Synopsys' RSoft products version 2015.06 are available now. Customers with a current maintenance agreement can download this version from the Synopsys website using their SolvNet® account.

About Synopsys' RSoft Products

Synopsys' RSoft products are leading solutions in photonic design software and serve several industries including optical communication, optoelectronics and semiconductor manufacturing. RSoft products provide a full range of design, optimization and planning tools for optical communications, as well as solutions for optoelectronics components and subsystems. For more information, visit http://optics.synopsys.com/rsoft.

About Synopsys

Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As the world's 15th largest software company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP, and is also a leader in software quality and security testing with its Coverity® solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing applications that require the highest quality and security, Synopsys has the solutions needed to deliver innovative, high-quality, secure products. Learn more at www.synopsys.com.

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