

**Release Notes**  
**RSoft OptSim, OptSim Circuit and ModeSYS**  
**Version 2019.09**

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**Optical Solutions Group**

**September 2019**

**SYNOPSYS®**

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## OptSim, OptSim Circuit and ModeSYS

OptSim, OptSim Circuit and ModeSYS version 2019.09, Synopsys' RSoft System Tools, include the following changes:

- **Support for statistical scans for compound component parameters and symbol table variables**

Assigning stochastic distribution to parameters, a feature that was already available for supplied compact models, has been extended to the parameters of compound components. PICs and sub-systems are often hierarchical to facilitate design re-use and scalability. Ability to associate stochastic distribution to hierarchy parameters and symbol table parameters make it more convenient to carry out performance bounds, tolerancing and yield analyses via Monte Carlo scans.

- **Simulation speed improvements for photonic integrated circuits**

Algorithms for inter-domain conversions (time and frequency) during computations have been updated to enhance simulation speeds of photonic integrated circuits (PICs).

- **Ability to relocate PDKs to non-default location**

Collaborative projects sometimes require PDK repository in non-default location. A Utility is available via OptSim Circuit GUI allowing users to move the PDKs to non-default locations, or to add a non-default location to the search path for PDKs. The relocated PDKs can be accessible via models' tree.

- **Improvements to enhance user experience**

Based on customer feedback, a number improvements are made to improve usability and to provide added flexibility. Some of these include:

- Allow simulation of design files in multiple OptSim GUI windows at the same time
- Support pre-assigning expected signal type to the compound component's input and output ports

- **Circuit simulation support for following foundry PDKs**

- AMF

- **Updates to the following foundry PDKs**

- TowerJazz
- IMEC
- AIM Photonics (AP-SUNY)

- **New application notes and design files to help users shorten design time**

- *TowerJazz PDK-based Quadrature Phase-Shift Keying (QPSK) Transceiver PIC and study of quadrature imbalance due to process variations*

TowerJazz is the only commercial, open photonic foundry today. OptSim Circuit and OptoDesigner support TowerJazz PDK. QPSK transceivers are scalable to support higher-order modulation and are of immense interest to the data center interconnect industry. An application note is added in OptSim Circuit showing the PIC design flow stages from idea to fabrication. Since fabrication process variations can cause quadrature imbalance, the application note also analyzes its impact.

- *Receiver sensitivity for BPSK modulation*

While QPSK is preferred in many data center applications, binary phase-shift keying (BPSK) remains an application of interest for the defense and aerospace sector partly due to the radio frequency (RF) legacy. A new application note is added in OptSim for receiver sensitivity studies of BPSK-based systems at different data rates.

- *Light Fidelity (LiFi) over Free-Space Optics (FSO)*

There is an increasing amount of interest from industry in modeling LiFi and visual light communication (VLC). To reflect the industry trend, a new application note is added in OptSim as a prototype to designing IEEE 802.15.7 based short reach VLC (SR-VLC) link over free-space.

- *100GBASE-SR4 SWDM4 transmission over Prysmian WideCap OM4 fiber*

IEEE 100GBASE-SR4 paves a way for migration of intra-data center interconnects from 40G to 100G. Reflecting the industry trend, a new application note is added in ModeSYS illustrating a design of high-speed VCSEL-based 100GBASE-SR4 SWDM4 transmission over a commercial OM4 fiber based on measurements published by Finisar.

- **Miscellaneous bug fixes, additions, and improvements**