

Release Notes
RSoft Photonic Component Design Suite
Version 2018.03

Optical Solutions Group

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SYNOPSYS®

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Changes to All Products

- Major enhancements to the S-Matrix/PDK Generation Utility, which automates the creation of custom process design kit (PDK) models to create a new PDK, augment an existing PDK, or generate IP. The PDK models can also be simulated in Synopsys' OptSim family of products and exported to Synopsys' PhoeniX Software OptoDesigner for layout. The release adds support for:
 - Parametrization of S-matrices, allowing multiple variants of a component to be studied within OptSim Circuit or layout in PhoeniX OptoDesigner. This includes, for example, the radius of a ring, the width/height/length of a waveguide, or any other structural, material, or generic property.
 - Parametric custom PDK models used in OptSim Circuit can use OptSim's statistical modeling capability to study fabrication tolerances, yield, etc. Furthermore, S-Matrix data is interpolated and GDS II mask data is produced automatically at requested parameter values.
 - New S-Matrix Viewer to display S-Matrix data quickly and easily.
 - Automatic icons and improved port placement for custom PDK models in OptSim Circuit.
 - Expanded documentation.
- Enhanced support for all silicon photonics applications, including:
 - The silicon material model can now include the complex index perturbation due to free carriers (i.e., doping), allowing this effect to be easily included in all passive tool simulations including FullWAVE, BeamPROP, ModePROP. The effect of incomplete ionization can also be included.
 - Direct calculation of carrier dependent index from carrier densities in the Synopsys Sentaurus TCAD interface for consistent material modeling in all contexts.

Changes to RSoft CAD

In addition to the changes listed in the All Products section, the following changes apply to the RSoft CAD:

- Fixed issue where anisotropic diffused structures were not recognized.
- Updated n/k for silicon nitride material which may change results.

Changes to FullWAVE

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to FullWAVE:

- Achieved 30% speed improvement to dispersive simulations.

- Automatic optimized fitting of dispersive material parameters.
- Corrected issues with recently added feature to deal with PML instabilities with dispersive materials. Enabled in all cases, was previously enabled just for the Effective Index Method (EIM, or 2.5D).
- Fixed issue related to cluster calculations involving multiple computers.

Changes to BeamPROP

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to BeamPROP:

- New 3D wide-angle BPM algorithms, further extending BeamPROP's capabilities to simulate structures in silicon or other high-index contrast materials.

Changes to DiffractMOD

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to DiffractMOD:

- Fixed issue for monitors oriented along non-Z directions.

Changes to ModePROP

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to ModePROP:

- Fixed issue for monitors oriented along non-Z directions.

Changes to BSDF Utilities

In addition to the changes listed in the All Products, RSoft CAD, and DiffractMOD/FullWAVE sections, the following changes apply to the BSDF Utilities:

- Fixed memory issue in RSoft BSDF UDOP for use in Synopsys' LightTools software.

Changes to Multi-Physics Utility and Sentaurus TCAD Interface

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to the Multi-Physics Utility and Sentaurus TCAD interface:

- Improved design flow in Sentaurus Workbench for tutorial examples.
- Fixed PATH issue when opening the RSoft CAD from Sentaurus Workbench.
- Direct calculation of complex index perturbation from carrier densities using the tdrutil utility.
- Fixed TCAD bootstrap issue when automatically creating an RSoft design file from Sentaurus Workbench.

Changes to LaserMOD

In addition to the changes listed in the All Products and RSoft CAD sections, the following changes apply to LaserMOD:

- Improved incomplete ionization and free-carrier dependent index/absorption of silicon.