



Change Log

PHOTOSS 5.92

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Jens Lenge
Celler Straße 25
59192 Bergkamen
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PHOTOSS Change Log in L^AT_EX by:
Dipl.-Phys. Matthias Westhäuser and Dipl.-Ing. Simon Akhtari

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1 Introduction

1.1 What is a Change Log?

A Change Log is a list which contains the changes which have been made to a software between public releases. In most cases, only the important changes are contained in the log to keep the overview concise. It is a good idea to first take a look at the Change Log before using a new version of PHOTOSS in order to familiarize yourself with the changes and to avoid unnecessary overhead.

Changes may be categorized as follows:

- **New Features.** This category contains newly added and supported features and / or new functionality.
- **Updates.** This category covers changes to algorithms and functionality which is mostly concerned with computational speed or a change in conventions or restrictions. It may also contain information about changed precisions of implemented algorithms.
- **Bug fixes.** If a functionality is not implemented correctly, it said to contain a “bug”. If a bug is encountered or reported and fixed, it is cataloged in this category.

Please note that new features are only described briefly in a Change Log. To get more detailed information about a new feature or functionality, please refer to the PHOTOSS user manual instead. Changes made to PScript are documented in more detail in the separate PScript manual.

2 Version Changes

2.1 Version 5.92

2.1.1 Overview

Version 5.92 contains some new functions for PScript, improved GPU-selection and support for new MATLAB® versions.

2.1.2 New Features

- MATLAB® 2012a, 2012b and 2013a are now fully supported.
- New PScript function `timestamp()` allows for pinpointing time and date in log files.
- New PScript functions `saveVariables(...)` and `loadVariables(...)` can be used for export and import of selected variables to and from XML files.
- When using PScript, the component grid of a network now has a maximum size of 1024 by 1024 fields (was 128 by 128).

Please refer to the PScript Manual for more details regarding PScript functionality.

- New components *Sample Exporter* and *Sample Replacer* allow for manipulation of the sampled signal outside PHOTOSS using a simplified text format.

2.1.3 Updates

- Official support for CUDA devices with Compute Capabilities 1.3 to 3.0
- Automatic GPU selection now considers any CUDA devices with Compute Capabilities from 1.3 to 3.5.
- Improved algorithm for automatic GPU selection

PHOTOSS will use devices with Compute Capabilities above 3.0 if selected. Please note however that these have not been tested with the program.

2.1.4 Bug fixes

- Folder Creation with PScript: Removed a bug that caused the folder to be created twice.
- MIMO Equalizer: Removed a bug that caused the Random Generator to be reset to “Random” regardless of the simulation parameter value.
- When setting a built-in parameter, true and false are now always correctly recognized as booleans.
- File Loader: Fixed a bug which, regardless of the value of “adjustSimParams”, let the Built-In Simulation Parameters be overwritten when loading MATLAB® MAT-files.
- File Loader: The value “Always ask” of the parameter “adjustSimParams” is no longer supported.

2.2 Version 5.91

2.2.1 Overview

Version 5.91 contains major changes to the concept of simulation parameters and global variables. The latter have been completely replaced by a more flexible and customizable concept of custom and built-in simulation parameters. Complex parameter variations are now much easier to handle. More details can be found in the user manual.

You will also note that PHOTOSS will now check each component or simulation parameter for a valid value before accepting it.

2.2.2 New Features

- New concept of custom and built-in simulation parameters. Parameters can now be used as placeholders. Thus, parameter variations are more flexible.
- PScript functionality has been greatly extended (refer to the PScript manual for more details).
- MATLAB® 2011b is now fully supported.
- New Component MIMO Equalizer can now be used to automatically compensate for linearly distorted signals (PMD, PDL, crosstalk, etc.).
- The random generator offers a new “semi-deterministic” mode for reproducible Monte Carlo parameter variations.
- The random generator seed can now be set in the GUI (and also by using PScript).
- Component dialogs now “remember” their size and position. You do not have to resize them manually more than once any more.
- Component Result Importer can now be used to import values from a .txt file directly as a PHOTOSS result (useful when using MATLAB® and PHOTOSS interaction).
- Component Optimization Tester can now be used to experiment with various optimization algorithms which have been implemented in PHOTOSS and which will also be used in new components in upcoming versions of PHOTOSS.
- Component Phase Ripple Emulator can now be used to add sinusoidal phase ripple components to a signal which are (e.g.) generated by Chirped Fiber Bragg Gratings with a non-ideal dispersion map.
- Components Adaptive Equalizer and Adaptive One Tap Equalizer have been added which are suitable for mitigation of PMD, PDL or crosstalk effects. They use various optimization routines and training sequences to derive the complex equalizer coefficient(s). Optimization algorithms can be tested using the Optimization Tester component.
- The new component Crosstalk Emulator can be used to generate coherent crosstalk for a multi core fiber.
- New examples have been added to demonstrate PHOTOSS and MATLAB® interaction and the creation of custom MATLAB® components.
- Automatic GPU detection was added which chooses upon every SSMF fibre start the GPU that has the best performance to load ratio.

2.2.3 Updates

- The PHOTOSS manual has been greatly revised for more detailed descriptions of PHOTOSS concepts of the simulation environment.
- EDFA component has been optimized for a faster computational speed (becomes obvious when using signals of larger size).
- Polarimeter component can now save its results to any desired path (relative paths are allowed).
- Bit Polarimeter component can now save its results to any desired path (relative paths are allowed).
- PMD/PDL Emulator component can now save its results to any desired path (relative paths are allowed).
- A warning will be displayed when converting an optical signal to the electrical domain while using analytical noise *without* having added noise components before.
- White spaces can no longer be used in custom simulation parameters (or imported “global variables”).
- The “data” structure included in the “MultiSignal” in MATLAB® components has been renamed to “modulation” in order to clarify its purpose.
- The component Transversal Filter no longer uses dynamically generated parameters for its FIR and IIR taps. Instead, these parameters can now be loaded directly from a file.

2.2.4 Bug fixes

- GPU nonlinear fiber calculation: Fixed a bug which lead to “QNAN” values which occurred only when using GPU calculation, nonlinear fiber, self-steepening and two polarization axes at the same time.
- File Loader: If a File Loader is used to convert analytical noise signals to numerical noise signals, the signal will no longer be invalidated, when there is no analytical noise present for the currently processed channel. No numerical noise will be added instead.

