# Press Information

Berlin, May 9, 2022

VPIphotonics Design Suite – Version 11.3

New release of industry-leading design software for photonic components and optical transmission systems

VPIphotonics Design Suite Version 11.3 provides access to professional application-specific simulation tools and pluggable toolkits. They offer flexible usability, design process, and data analysis capabilities.

Version 11.3 advances the simulation and design flow for many applications: data-aided digital signal processing, forward error correction, free-space optical communications, Raman pump optimization, grating couplers, semiconductor optical amplifiers, multimode coupling, and more.

Our software solutions have been proven by commercial companies and educational institutions who have utilized them to win and successfully execute many research an design projects. With the improved capabilities provided in Version 11.3, our design suite is set to deliver the same outstanding results in the future.
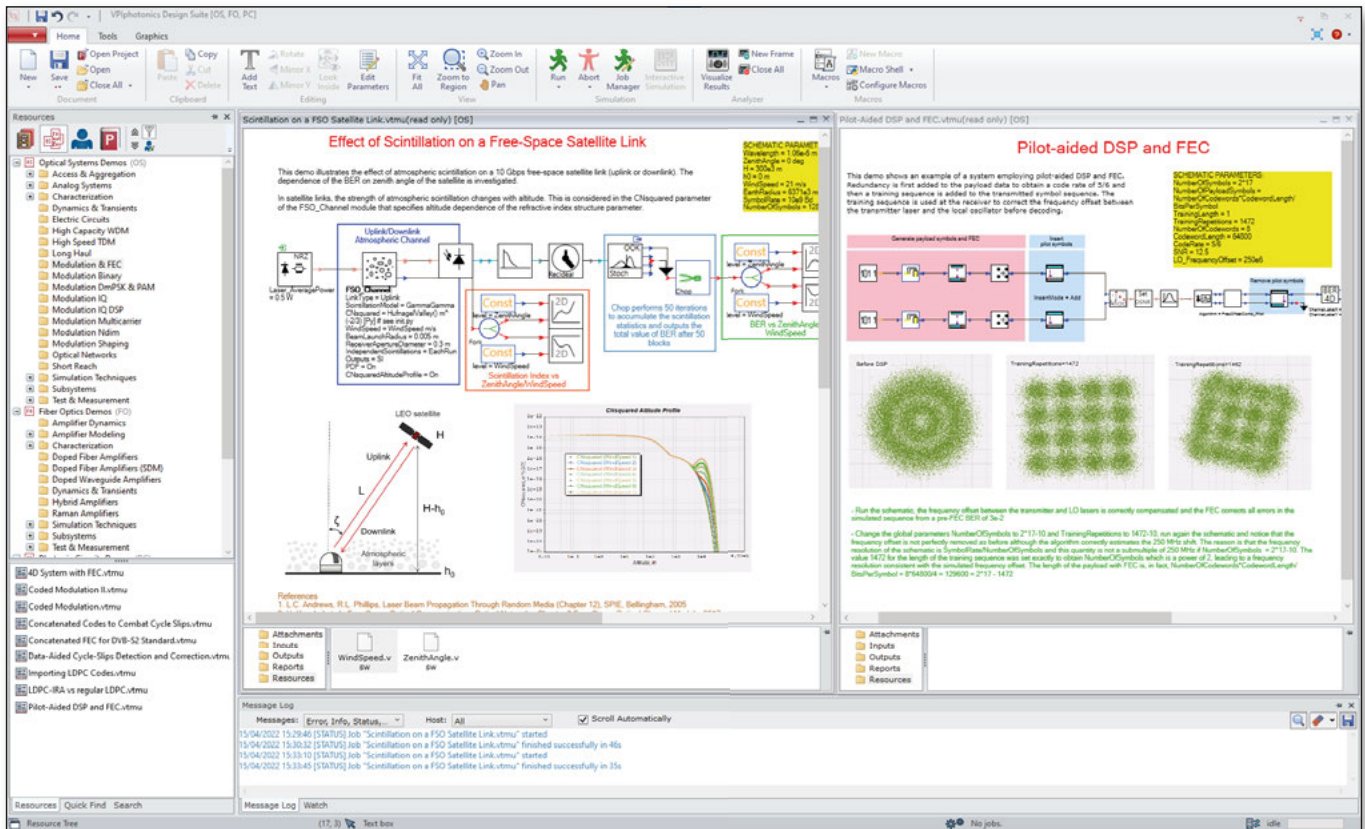
Photonic Design Environment (PDE) of Version 11.3

Short list of key features in Version 11.3

- **Sorting of DSP algorithms** – Improved sorting order of built-in DSP algorithms, with updated categories for easy access and implementation
- **Pilot Symbols for DSP** – New modules add/remove arbitrary sequences of pilot symbols for pilot-aided DSP algorithms
- **Pilot-aided DSP algorithms** – New algorithms for frequency offset compensation and maximum likelihood based carrier phase recovery that exploit pilot symbols for single- and multicarrier signals

- **RS-based FEC** – Enhanced FEC encoder/decoder to support Reed-Solomon codes of user-definable codeword lengths
- **PAM4 analysis** – Direct calculation and display of signal metrics for PAM4 signals in the Analyzer

- **FSO channel** – Enhanced model to simulate Gaussian beam propagation through a turbulent atmospheric channel in a satellite uplink and downlink
- **PPM encoding** – New M-ary pulse position modulator with any number of bits per symbol using Gaussian-shaped pulses and corresponding demodulator
- **Raman pump optimizer** – Enhanced module to support multiple optimization wavelength ranges and pumps within them
- **Interface to ZOS** – New module interfacing to Zemax OpticStudio to calculate the light coupling between two multimode waveguides via an optical imaging system

- **S-Matrix without phase** – Extended PIC Elements modules to support passive device modeling with absent or wrapped phase information in device S-Matrix files
- **Grating Coupler** – New passive grating coupler with a measured and behavioral model supporting various spectral transfer functions
- **SOA** – Measured SOA with length independent model definition and support of a chain of subsections to accurately calculate device properties

- **Parameter browser** – New dialog to overview parameter usage, search for a parameter, change parameter values in multiple schematics at once
- **Copy traces in Analyzers** – Enhanced support to copy signals between different Analyzer frames and Analyzer windows using different axis units
- **Python Debugging** – New approach to debugging Python cosimulation, simulation scripts, or initialization scripts based on Microsoft Visual Studio Code
- **Resource Replacement** – Greatly simplified update of obsolete module versions with redesigned Resource Replacement Wizard

Version 11.3 provides access to more than 900 ready-to-run simulation setups. We added new and improved demo examples to illustrate the application of the new features and modules.

Design Example – 800G FR-4 WDM for Ethernet Applications

This simulation setup demonstrates the transmission of 4*200G FR-4 WDM channels with 112.5 Gbaud as specified by the 800G Pluggable MSA technical specification [1]. Four wavelength-separated transmitters in the O-band emit a PAM4 signal each. The outer FEC encoder utilizes Reed-Solomon RS(544,514) coding.

The setup shows the impact of bandwidth limitations on the system performance and the capability of the RS-based FEC. BER pre-FEC and post-FEC are used to evaluate the system performance.

References
[1] 800G Pluggable MSA 4x200G-FR4 Technical Specification Draft 1.0.
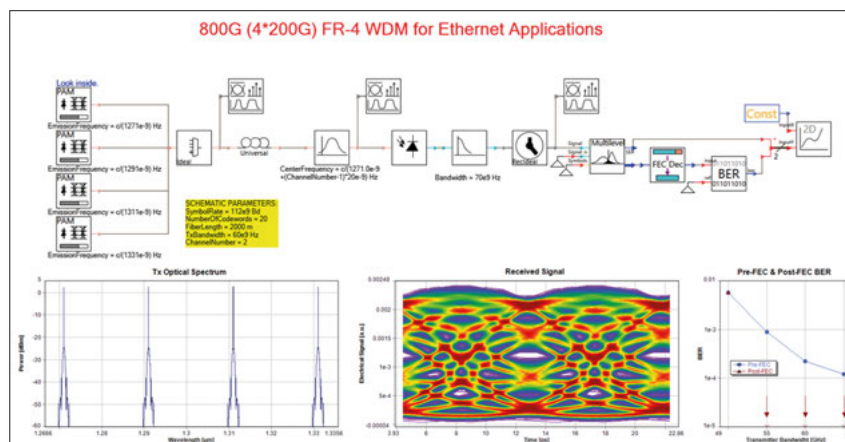
4x200G PAM4-based transmission over 2km utilizing RS(544, 514) FEC

About VPIphotonics

VPIphotonics™ sets the industry standard for end-to-end photonic design automation comprising design, analysis and optimization of components, systems and networks. We provide professional simulation software supporting requirements of optoelectronics, integrated photonics and fiber optics applications, optical transmission system and network applications, as well as cost-optimized equipment configuration. Our team of experts provides professional consulting services addressing customer-specific design, analysis and optimization requirements, and delivers training courses on adequate modeling techniques and advanced software capabilities.

VPIphotonics' award-winning off-the-shelf and customized solutions are used extensively in research and development, and by product design and marketing teams at hundreds of corporations worldwide for 20+ years. Over 160 academic institutions joined our University Program enabling students, educators and researchers an easy access to VPIphotonics' latest modeling and design innovations.

For further information, please visit us at www.VPIphotonics.com.