VPIphotonics

DESIGN AUTOMATION

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VPIphotonics and PhoeniX Software integrate solutions to enable rapid layout-aware circuit design of ASPICs based on LioniX International TriPleX™ technology

VPIphotonics and PhoeniX Software in cooperation with LioniX International teamed up to develop a photonics Process Design Kit (PDK) supporting the seamless integration of circuit simulation and layout design of application-specific photonic integrated circuits (ASPICs) to be processed on LioniX Internationals TriPleX™ technology platform.

VPItoolkit PDK LioniX represents a new pluggable library extension to *VPIcomponentMaker Photonic Circuits* providing circuit-level simulation support of the PDK building blocks for the integrated optical waveguide technology TriPleX™ by LioniX International.

Each building block is characterized by only a few user-defined parameters and is represented with an adequate simulation model. Physical locations and orientations of building blocks on the layout can be specified directly in *VPIcomponentMaker Photonic Circuits* thanks to the seamless integration with PhoeniX' photonic layout design tool *OptoDesigner*. Furthermore, sub-circuits with fixed locations can be connected by smart elastic optical connectors enabling combination of graphical schematic capture and automated waveguide routing.

This allows a designer to rapidly prototype ASPICs with prerequisite functionality without going deep into the details of device layout and fabrication process. All the custom building blocks available in *VPItoolkit PDK LioniX* can be used alongside with a broad set of standard modules and

instrumentation in *VPIcomponentMaker Photonic Circuits.* Hierarchical circuit designs and advanced parameter scripting, sweep and optimization of layout-defining parameters, sensitivity and yield analysis are supported transparently for designers helping to increase their productivity.

Finally, once the ASPIC design is completed and optimized, its layout can be exported to PhoeniX Software's *OptoDesigner* for adding packaging and electrical wires routing. *OptoDesigner* is the ultimate photonics design suite enabling designers to automatically synthesize photonics designs, driven by fabrication information and required optical specifications. It is the definitive platform for integrated photonics design and fabrication, with Process Flow visualization, Photonics simulations and Chip and Mask layout as the main modules. As last step the GDSII mask layout will be created and verified and can be sent to LioniX International for fabrication.

LioniX International proprietary integrated optical waveguide technology TriPleX™ is based on LPCVD processing of alternating Si3N4 and SiO2 layers. It allows for medium and high index-contrast waveguides that exhibit low channel attenuation. In addition, TriPleX™ waveguides are suitable for operation at wavelengths ranging from 400 nm through 2.35 µm. The high index-contrast and broad wavelength range make the TriPleX™ technology extremely suitable for a variety of applications ranging from telecom to sensing.
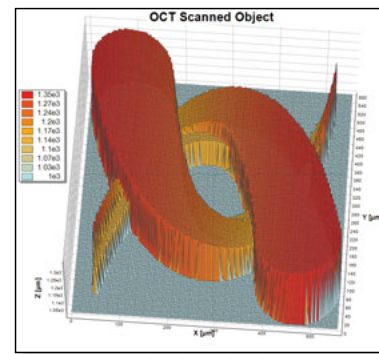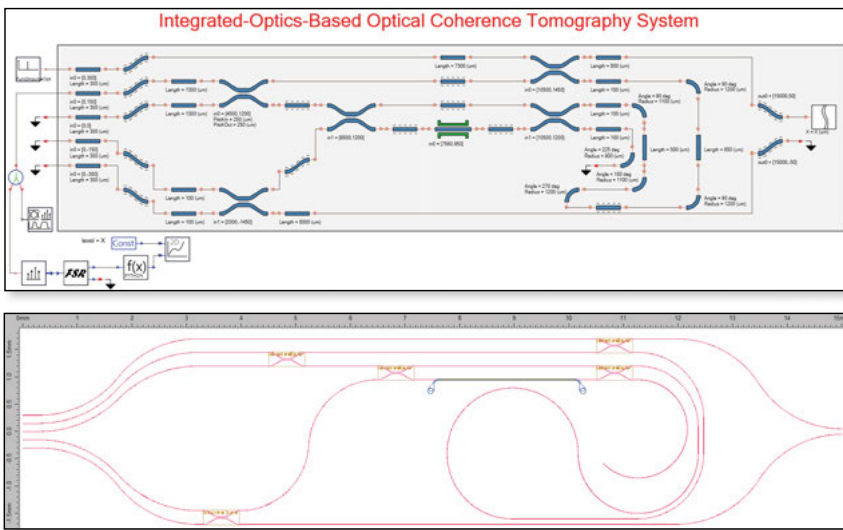
Design of Optical Coherence Tomography (OCT) system: Simulation setup (left, top) in VPIcomponentMaker Photonic Circuits, exported layout (left, bottom) in OptoDesigner using LioniX PDK, and exemplary simulation result (right, restored Sample after OCT)

Visit our teams at Photonics West 2017 for more information: live demonstrations are performed at VPIphotonics booth 4629-10. See an OCT example PIC at LioniX International booth 5266.

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 addressing demands in integrated photonics and fiber optics, optical transmission links and networks. Our team of experts performs design services addressing customer-specific requirements, and delivers training courses on adequate modeling techniques and advanced software capabilities.

Our 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. 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.

About PhoeniX Software

Pioneering photonics design automation already since 1991, today PhoeniX Software has a global presence and is a trusted and well recognized partner for a large number of organizations. PhoeniX Software enables the easy and cost-effective realization of integrated photonics chips and systems, by means of internally developed superior products and services. Customers range from large OEM's to start-ups and include some of the world's top universities and research institutes. As the leader in Photonic IC design solutions, PhoeniX Software will

continue to support the transition of PIC technology from the lab into the fab, by anticipating market demand and customer needs. In combination with strategic partners, this results in offering world class design flows and access to all relevant fabrication technologies for our customers.

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

About LioniX International

LioniX International is a leading global provider of customized microsystem solutions, in particular integrated photonics-based. We provide customized solutions for OEMs and system integrators, from design to fully assembled modules, by vertical integration and in scalable production volumes. We secure our technology leadership by maintaining our strong IP position. LioniX International B.V. was established in April 2016 and includes SATRAX B.V., XiO Photonics B.V. and LioniX B.V. –

a suite of independent companies that had been active in the technology development of photonic integrated circuits for a suite of applications since 2001. Currently, LioniX International employs nearly fifty highly educated personnel, including a management team that has decades of experience in the micro/nano system technology space.

For further information, please visit us at www.lionix-international.com.