



Importance of computational models

Commoditization of photonics technologies has already reached a significant level and it is still ongoing or even accelerating. This gives access to — so far, out-of-range — photonic technologies for developing new applications and devices, which have the power to rapidly change areas such as health care, food safety, surveillance, remote sensing, and others.

To make use of such new opportunities, application designers have to be capable of analyzing feasibility of envisaged designs and their performance and of selecting the right components. This means that user-programmable computations are needed to design and analyze feasibility and performance of new photonic applications. Furthermore, the process of developing computational models is often key to obtaining a more profound understanding of the problem to be solved as well as its underlying physical principles. Such computations can range from “back-of-the-envelope” calculations to comprehensive analytical and/or numerical models.

Using easily accessible tools

Dr Waegli uses MS Excel® — readily available on almost every computer — to study photonics problems and to design, analyze, and optimize photonics applications. With Excel, calculations can be set up quickly without the need to learn a special programming language. Also, Excel comes with a full range of mathematical functions, excellent graphics, and user-interface capabilities. Moreover, it is an extremely fast matrix calculator and handles large data sets. Dr Waegli has built models for a wide range of optics applications:

Geometrical Optics

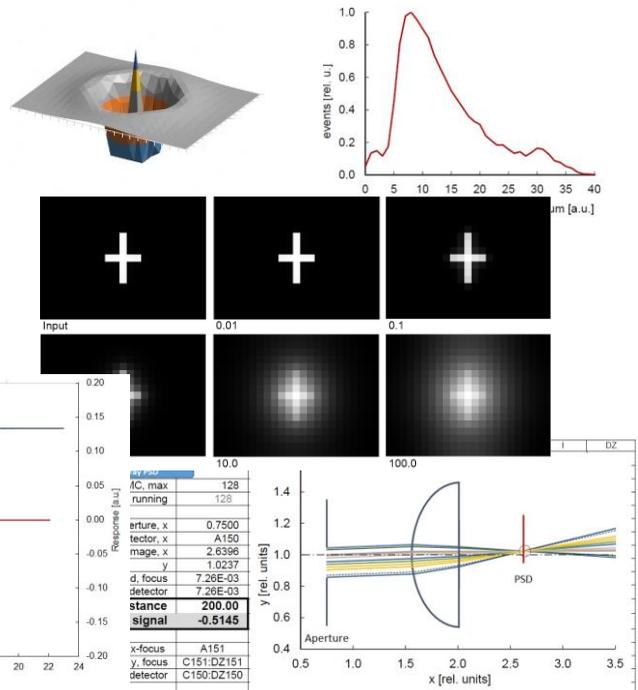
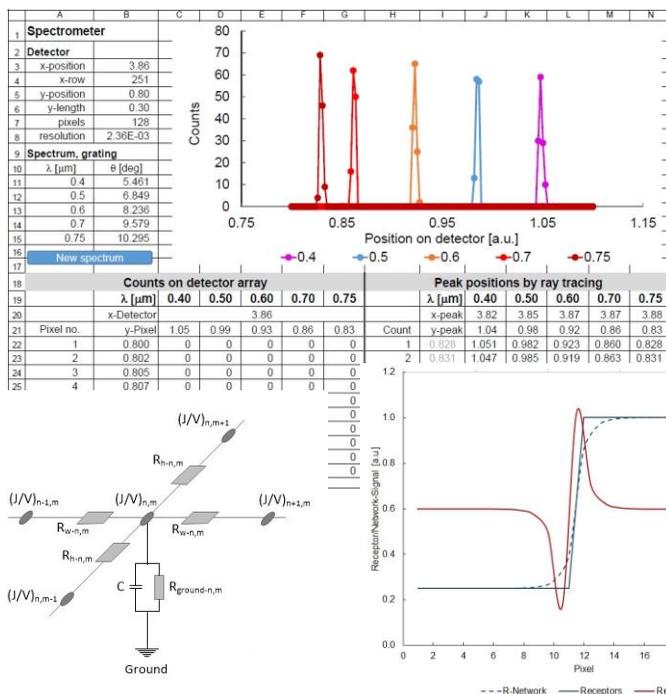
- Ray tracing

Electro-Optics and Radiometry

- Radiation transport
- Radiation sources
- Detectors

Physical Optics

- Electromagnetic waves
- Diffraction
- Interference



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- Business Analysis and Development
- Complex Problem Solving

for further information contact:

Dr. Peter Waegli
Dr. P. Waegli-Research

Internet: <http://www.waegliresearch.com>
Email: pwaegli@waegliresearch.com
Tel: + 41 - 56 - 633 31 12

Bibenlosstrasse 41
CH-5620 Bremgarten / Switzerland