CONCERTO V3 Preview

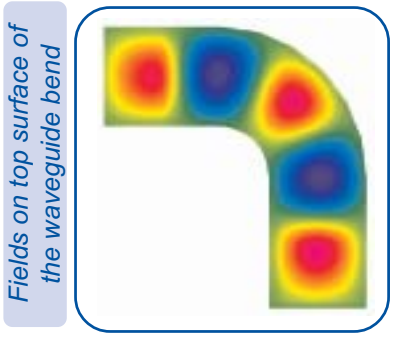
A new version of CONCERTO, the software package for RF and microwave design, is introduced. CONCERTO has already proved itself to be the fastest and most accurate package for high frequency analysis, and the new release now concentrates on the user interface. This new version will be available in the second quarter of 2002.

The Finite Difference Time Domain method used in CONCERTO is already widely accepted as the most effective technique for high frequency design and analysis. Consequently, with the new features in Version 3, particularly for modelling and data input, CONCERTO is proving itself to be the software for RF and Microwave design.

Model Creation

Two philosophies are being introduced for model creation. The first is to use a 3D geometric modeller to create complex models. The modeller already developed for use in OPERA is based on the industry standard ACIS library from Spatial Technology. The SAT files created by this modeller, or any other CAD system, can then be imported into CONCERTO, and combined with other entities. Adding ports, defining material properties, and applying the boundary conditions is then all that is required to prepare the final model. Complex waveguide structures (see Figure) can easily be defined in the Modeller, and then analysed in the CONCERTO Simulator.

Waveguide defined using the Modeller



Fields on top surface of the waveguide bend

The second philosophy makes use of the User Defined Objects in CONCERTO – parameterised objects built using a scripting language, and loaded into the editor as required. A large library of UDOs has been defined, allowing complex structures to be created by placing together a number of these UDOs.

A visual library manager makes the selection of the appropriate UDO straightforward, and with the number of UDOs in the library growing to hundreds, the facility to create parameterised models for optimisation has never been easier.

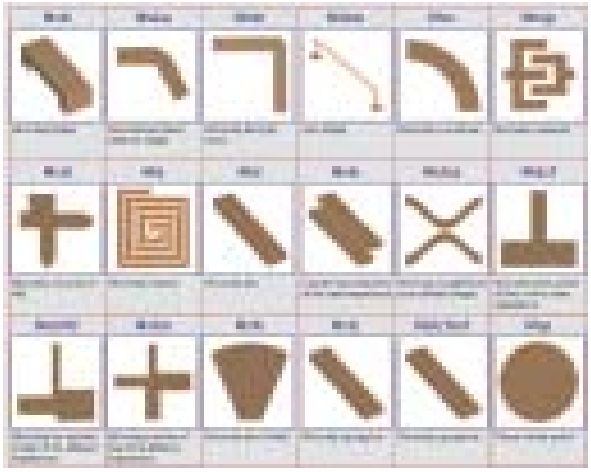
Other New Features

A unique feature in CONCERTO is the introduction of a new extended mode of S-parameter extraction. In this mode, full information is provided about absolute values as well as phase angles of propagation constants and reference impedances at each port. This information may be very important, for example, in the investigation of lossy transmission lines, evanescent modes in waveguides, or leaky modes in dielectric guides. In the new system the complex propagation constant is taken into account for S-matrix transformation with virtual shift of reference planes. It also allows correct calculation of circuit power balance, even below the cut-off frequency of the considered input and/or output guides.

Following the suggestions by some of our customers, we have introduced new functions for convenient emulation and monitoring of signals, which correspond to the Time Domain Reflectometry measurements. The earlier existing Envelope windows have been supplemented with the capability of locating transmission line discontinuities, detecting their nature, and calculating impulse reflection coefficient directly in time domain. A pulse of user-defined rise-time has been added to the list of available excitation waveforms. This will soon be extended to include any user-defined waveform.

Waveguide coupler using the Modeller

When displaying field contour plots, the value of the field can be determined by moving the cursor over the point of interest, and reading the field value from the bottom of the window. It is also possible to manually scale the display, to have user defined maximum and minimum values on the scale (for ease of reading values). In addition, the scale can be converted to Black and White, for better inclusion in reports.



A sample of UDOs for planar circuits, each parameterised and capable of optimisation