WIPL-D Microwave Pro

- Features and Improvements in Previous Versions -

6.0

New Features:

- Numerous Upgrades in Filter Designer
  - A number of bandpass and bandstop filters were added,
  - The filters are available in ideal line and microstrip technologies,
  - Parallel Coupled Resonators, Coupled SIRs and Hairpin Line are new bandpass filters,
  - Electrically Coupled Resonators, Open Stubs and Coupled Lines are new bandstop filters,
  - Minor improvements and bug fixes.
- Multiconductor lines – multiconductor lines are now available in microstrip and stripline technology.
  - 2D quasi static EM analysis method used for calculation,
  - One to eight conductors,
  - User controlled accuracy of the calculation,
  - Visualization of the multiconductor structure and segmentation,
  - Low frequency loss calculation – below the skin effect region.
- Impedance Calculator was improved by adding synthesis of Coupled Microstrip Lines from characteristic impedances of the even and odd mode.
- Expanded list of active 2 port network parameters with:
  - Conjugate input and output match calculation,
  - Maximum stable gain and maximum transducer gain calculation.

Detailed information on improvements/new features implemented in version 4 you can find in the document **WIPL-D Microwave Pro v6.0 - What is New.pdf**.

5.0

New Features:

- Active linear circuit analysis – To extend the application area of linear circuit simulator several features have been introduced to include the analysis of active microwave circuits. The new analysis options include:
  - Noise analysis
  - Stability analysis
  - Gain analysis
- Adding explicit ground connection for 2-port imported data files.
- De-embedding of imported 3D EM components has been improved so that a component can now be a part of a more complex circuit.
- Stripline library has been added.
- Coupled microstrip and striplines are introduced in Impedance calculator.
- Dielectric material other than air is now supported with waveguide analytical components (calculated using mode matching).
- One generator at a time – enables calculation of radiation pattern and near field while using global ports.
- Other options/improvements
  - Silent run
  - Import EM components with results
  - Microstrip frequency dispersion calculation improved
  - Analytical component of coupled microstrip lines

Detailed information on improvements/new features implemented in version 4 you can find in the document **WIPL-D Microwave Pro v5.0 - What is New.pdf**.

4.0

New Features:

- Improved analysis of frequency dependent materials
- Enhanced functionality of tuner
- One mouse click transformation from schematic to microstrip layout
- Two ideal transformer elements enabling mixed-mode S parameter analysis of differential circuits
- General ideal coupled line element
- General power divider element
- Four terminal transmission line elements (floating ground)
- Updated controlled sources elements with delay included

Detailed information on improvements/new features implemented in version 4 you can find in the document **WIPL-D Microwave Pro v4.0 - What is New.pdf**.

3.0

After sticking to v2.3 for some time, WIPL-D invested a significant effort to release a much-improved **v3.0**. Ease of use and higher degree of customization are the emphasis of this release when compared to the others.

New Features:

- Tuner tool enables the user to tune their circuits in real time and with multiple output results in parallel
- Ability to employ advanced GPU technology to decrease simulation time of circuits with large EM subcomponents
- Frequency dependent symbols enable analysis of frequency dependent components and materials
- Users are now able to use the Sweeper and Time Domain Solver in Microwave
- 49 new functions that can be used in the symbols list
- Change of all selected components model by a single click (e.g. EM to Analytical)
- H and E Taper added to the Rectangular Waveguide palette done with the Mode Matching technique

2.3

WIPL-D Microwave Pro v2.3 represents a much faster descendant of v2.2. The focus of this release is the speed-up in many segments.

New Features:

- Greatly accelerated simulation of circuits with large number of ports
- Up to 5 times faster writing of output results

2.2

WIPL-D Microwave Pro v2.2 introduces Mode Matching technique and represent a slight alteration of Microwave 2.0.

New Features

- Complete Rectangular Waveguide palette done with the **Mode Matching technique**

2.0

WIPL-D Microwave Pro v2.0 is an important upgrade from v1.1 in terms of speed of circuit simulation. The overall simulation of circuits consisting of ideal components is at least 10 times faster, and for closed-form components at least 15 times faster.

New Features

- **New component description technology** leads to multifold acceleration of S-parameters calculation
- Latest library routines used for **faster circuit simulation**
- Reduced overhead computations in optimization cycles
- Stored Range settings and Zoom Area option in the Graph window
- Link to **Time Domain Solver**

1.1

WIPL-D Microwave Pro v1.1 is a slight alteration of v1.0.

New Features

- Q-factor lumped element models
- Link to Filter Designer and Array Designer

While WIPL-D Microwave Pro v1.0 featured only the Lite version of Filter Designer, v1.1 links with professional tools for filter and antenna array design.

1.0

WIPL-D Microwave Pro v1.0 is the biggest improvement in comparison with WIPL-D Microwave Lite.
Features introduced with v1.0

- **No limits on circuit size** - circuits are simulated regardless of the number of nodes, components, or component ports.
- **Modular modeling of complex circuits** - hierarchical circuit modeling is enabled through usage of subcircuit components. Provided encapsulation simplifies the modeling and handling of complex circuits.
- **Mode-matching** based rectangular waveguide library - provides very accurate models of waveguide discontinuities that are much faster than 3D EM models. Number of modes taken into account at discontinuity characterization is user-definable.
- **Coplanar** waveguide library - including 3D EM and closed-form models of discontinuities.
- **Smart simulation** of EM and mode-matching components - circuit solver saves the results of previously done EM or mode-matching simulations and re-uses them when possible. This option is very useful in circuits including several identical components, or in optimization cycles with a low number of optimization variables.
- **Filter Designer Lite** - tool for easy LC filter design supports two approximations (Butterworth and Chebyshev). Filter Designer Pro will be released in future featuring more approximations as well as physical filter implementations like stepped-impedance, shunt-stub, edge-coupled, hairpin, combline,...
- **Improved visualization of results** - graph markers allow easy reading of specific points from 2D graphs. Tabular listing of results is improved by adding the Magnitude/Phase display capability.
- **New idealized components** - independent floating sources, dependent sources (VCVS,...), generic impedance and admittance, voltmeters.