Keysight Technologies
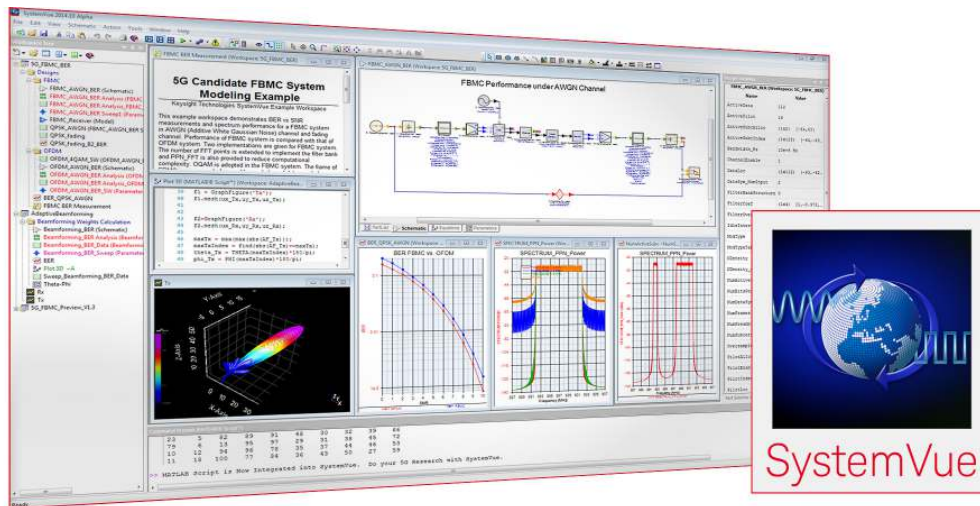# W1906BEL 5G Baseband Exploration Library
Simulation Reference Library for 5G Research

Data Sheet

KEYSIGHT
TECHNOLOGIES

Introduction

The W1906BEL 5G Baseband Exploration Library provides a ready-to-use set of source code with Keysight reference signal processing IP for 5G technology research. It provides an unmatched productivity increase for new baseband physical layer designs. The integrated simulation environment enables dynamic link level scenario investigation, implementation and verification of your Communications Physical Layer signal processing designs.

Reference models support various 5G candidate waveforms for both orthogonal and non-orthogonal type of multi-carrier communications systems, including advanced MIMO and beamforming signal processing techniques. The reference receiver can easily be re-designed to achieve the best performance and may be compared against the theoretical maximum performance.

5G Communication Architects, Baseband Algorithm Researchers, and Component Verifiers in R&D will benefit from the W1906BEL 5G simulation reference library.
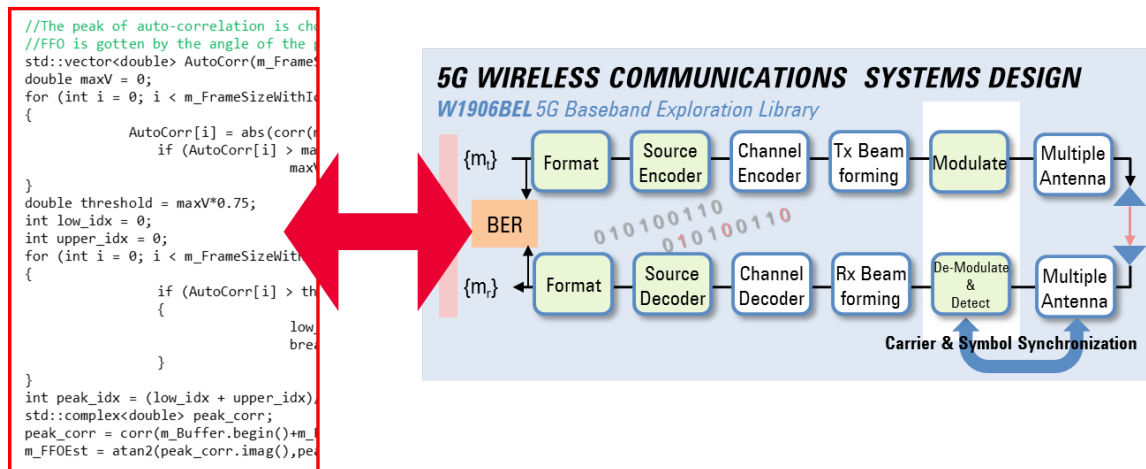

Figure 1. The W1906BEL 5G Baseband Exploration Library provides a ready-to-use set of source code with Keysight reference signal processing IP for 5G technology research.

Key Features

The W1906BEL 5G Baseband Exploration Library consists of source code, models, sub-systems, simulation examples and infrastructure components. Combined with the SystemVue communications architect platform it enables the rapid development and verification of high quality advanced digital modem designs. Access to the Keysight source code speeds confidence in your algorithmic development and offers an independent self-documenting reference library that enables you to quickly replace and modify blocks and subsystems during product design and development.

- Advanced digital signal processing blocks for 5G candidate waveform technologies
- End-to-end physical layer transmit and receive simulation models
- Signaling schemes for MIMO channels including spatial multiplexing, space-time coding and multiple detection methods
- Adaptive digital beamforming modeling examples
- Synchronization, channel estimation, and MIMO receiver functions
- Reference waveform generation to verify RF circuit design
- System level performance evaluation and BER/FER testing
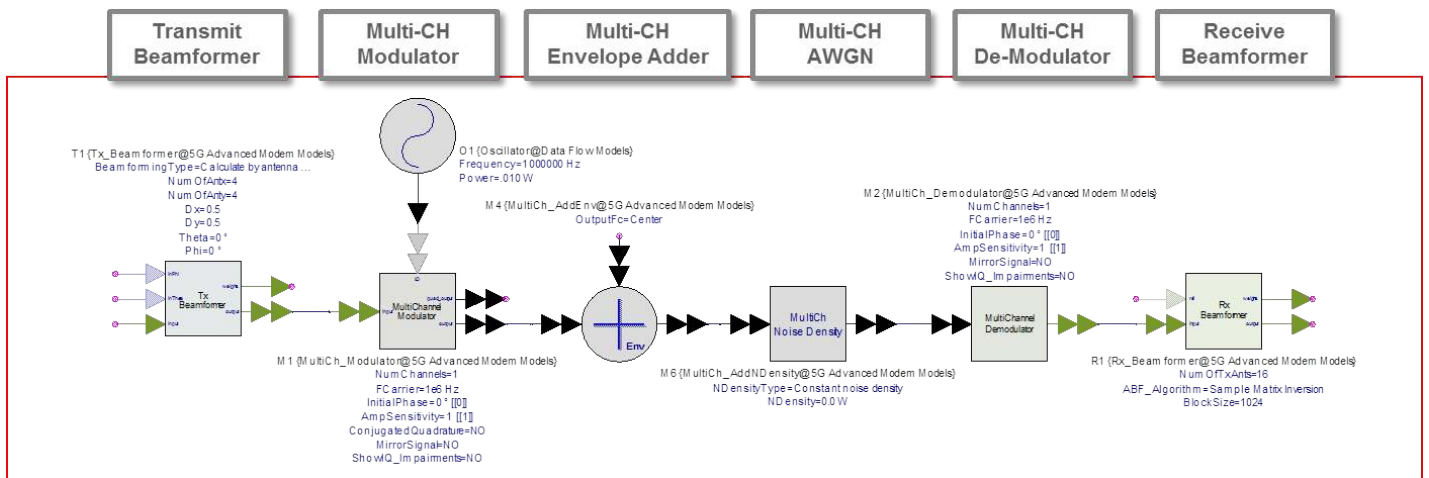- Multiple input and output modeling blocks

Figure 2. The unique vectorized ports connection capability uses the bus architecture for easy modeling of 5G multi-antenna techniques
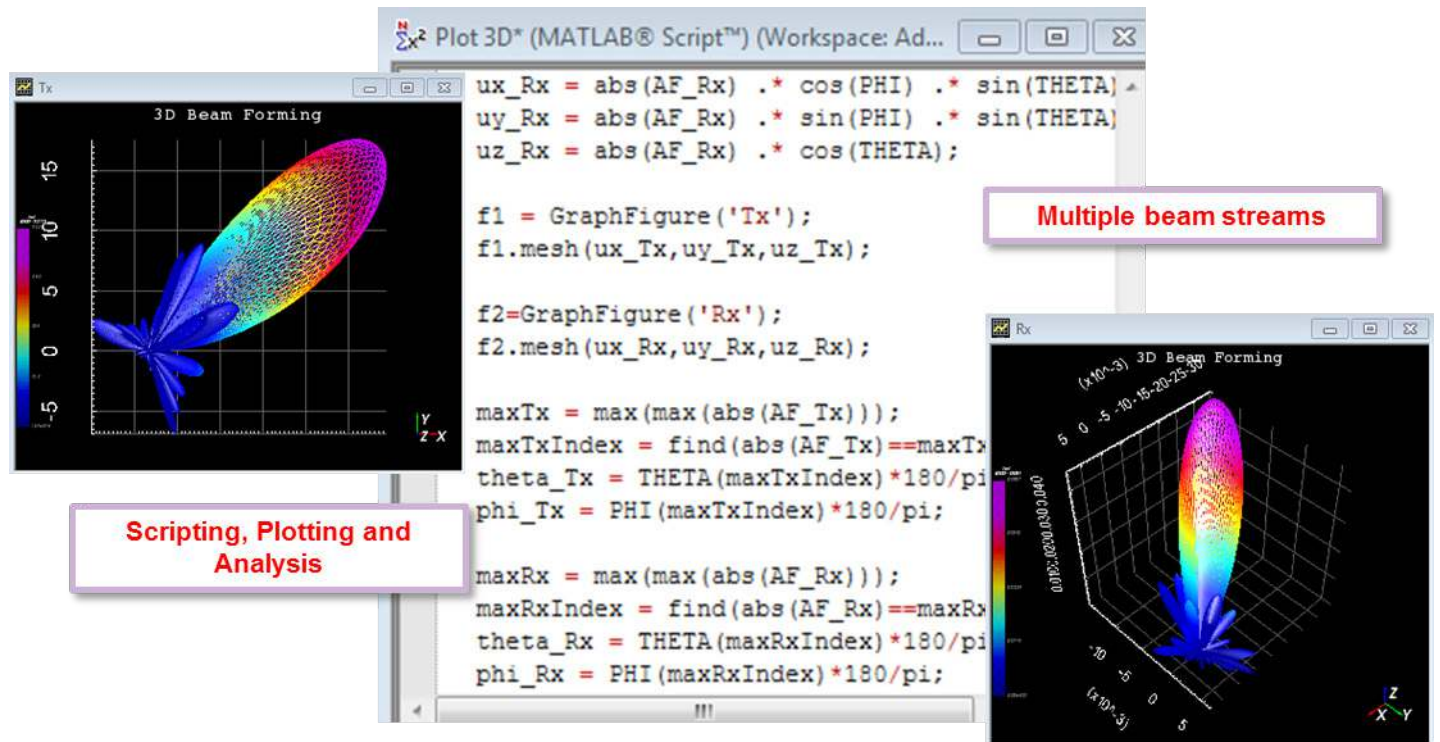
Figure 3. Advanced high speed display technique for 3D beamforming analysis.

Key benefits

- Accelerates your Physical Layer (PHY) design process
- Save time with a trusted, independent IP reference from Keysight
- Reduce project risk by validating baseband and RF integration early
- Streamlined process reduces functional verification and NRE in R&D
- Use simulations to fill strategic gaps such as missing hardware and MIMO effects for early throughput testing
- Use Keysight's simulations along with integrated test instrumentation for signal generation and analysis of your prototypes while the standard itself is still evolving
- Re-use the same Keysight IP and test assets throughout project development

Benefits of Source-Code level IP access

- **Advanced 5G access**
  Modifiable source code gives you an independent, self-documenting algorithmic reference library that enables you to quickly understand and explore key pre-5G PHY alternatives.
- **Platform for research**
  Control and script every detail, create exact test vectors and even single-step your way through operations with integrated debuggers.
- **Speed to insight**
  Troubleshoot more quickly. Keysight's trusted reference IP allows you to concentrate on your baseband design.
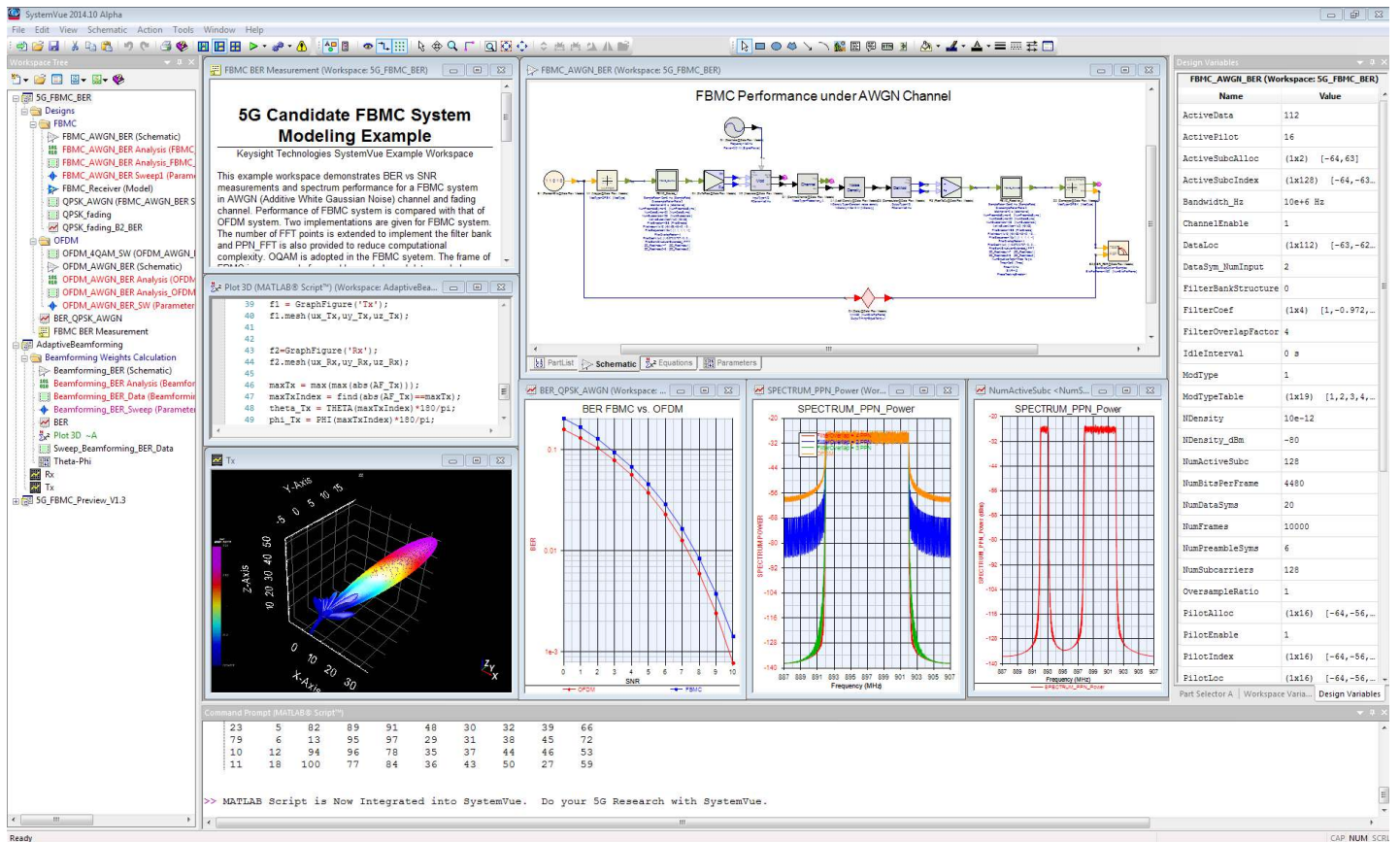
Figure 4. SystemVue's Baseband Exploration libraries build on top of verification libraries. They provide Keysight instrument-grade verification for algorithm developers in the earliest phases of a PHY design, so that ideas may be tested and proven right from the point of conception.

Speed Up Simulation Time

Individual simulations are fast so designers can run in batch mode to quickly explore the design space. An additional product, the W1712EP/ET SystemVue Distributed Computing 8-pack, enables you to farm out parameter sweeps to a compute cluster.

Configuration

The W1906BEL 5G Baseband Exploration Library may be added to any SystemVue environment or bundle. As the W1906BEL is a source code product, the W1718EP C++ Code Generator product is recommended, but not required. Also, the exploration library source files are delivered as Microsoft Visual C++ 2012 projects ("solutions"). While this particular compiler and version are recommended for highly-coordinated debugging with SystemVue 2014.10 on Windows, a range of C++ compilers are compatible with System-Vue GUI (Windows) and the W1711 SystemVue Engine (Windows and Linux).

Available SystemVue bundles:
  – W1461 SystemVue Comms Architect
  – W1462 SystemVue FPGA Architect
  – W1464 SystemVue RF Architect
  – W1465 SystemVue System Architect

For more detailed application information, refer to:
- www.keysight.com/find/eesof-systemvue-5g-exploration
- www.keysight.com/find/eesof-systemvue-videos
- www.keysight.com/find/eesof-systemvue-evaluation

myKeysight

myKeysight

www.keysight.com/find/mykeysight
A personalized view into the information most relevant to you.

www.keysight.com/find/eesof

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:
www.keysight.com/find/contactus

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:
www.keysight.com/find/contactus
(BP-09-23-14)

KEYSIGHT
TECHNOLOGIES