

Welcome at webinar:

Noise Parameter Solutions for Cryogenic LNA Design for Quantum and Space applications



Your host for today:



Maury Microwave

Your Calibration, Measurement & Modeling Solutions Partner!

Dirk Faber

Business Development RF& μ -Wave Solutions

email: dirk.faber@hitechbv.nl

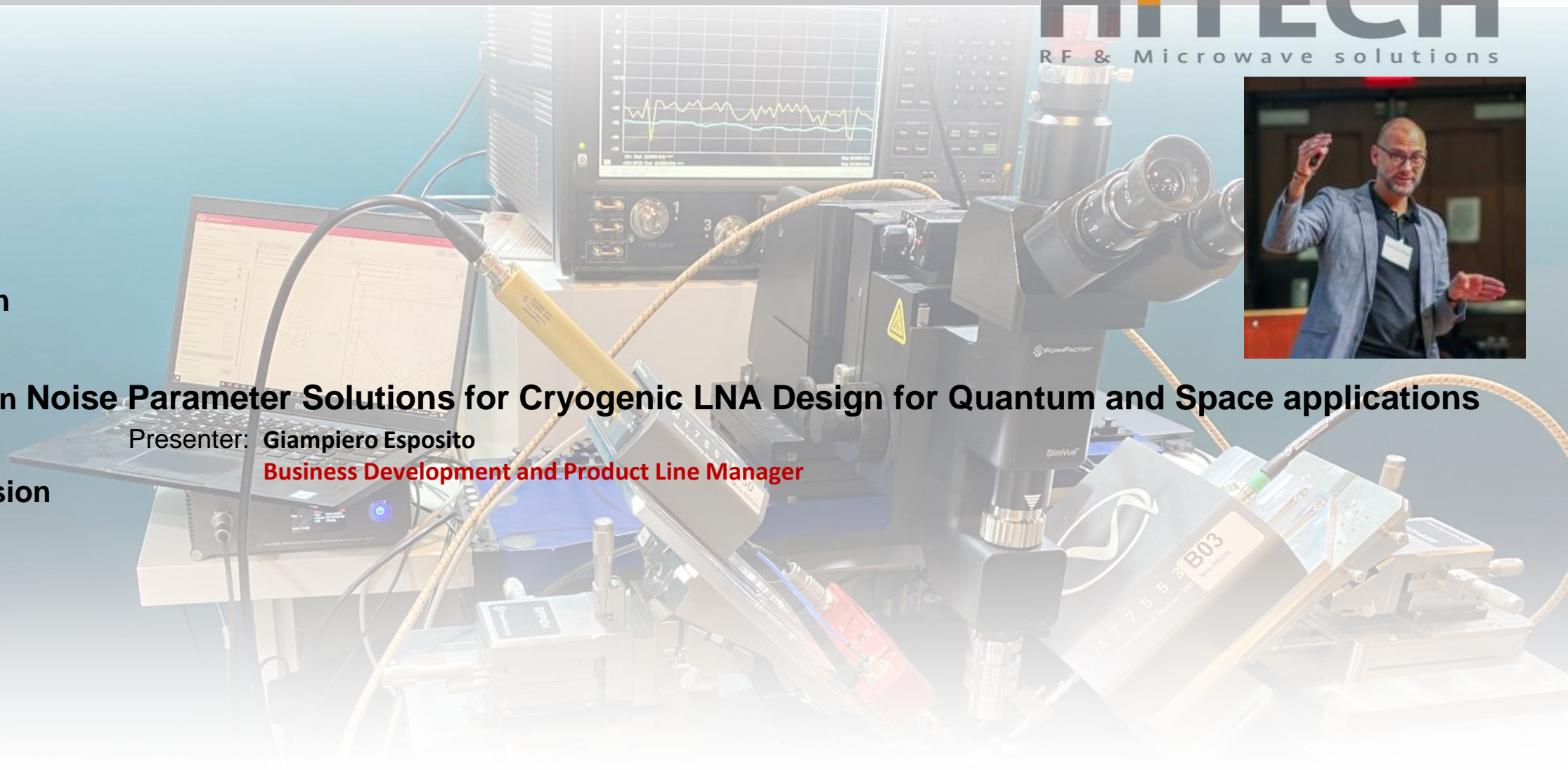
Hi-Tech RF & Microwave Solutions
Kwekerijweg 2a
3709 JA ZEIST
The Netherlands



Agenda:



- Introduction
- **Presentation Noise Parameter Solutions for Cryogenic LNA Design for Quantum and Space applications**
Presenter: **Giampiero Esposito**
Business Development and Product Line Manager
- Q & A Session



Your Device Characterization Team



Olaf Biezeman
CEO



Kamal Mustafa
Application Engineer



Ranny Hassoon
Application Engineer



Chris Caenen
Account Manager



Oliver Kanzler
Technical Sales



Dirk Faber
Business
Development



- Quality matters: we are ISO9001:2015 certified.
- Together with our customers and partners we provide the best "Device Characterization" solutions for the job.
- We believe in innovation and technology; we are looking for partnerships to ensure customers success. Not only now, but also in the long term.
- Hitech's team delivers consultancy and training for RF design, measurements and simulations.





Maury Microwave
Your Calibration, Measurement & Modeling Solutions Partner!

Territory coverage and responsibility

HITECH
RF & Microwave solutions

Hitech BV is responsible for sales, support, installation and training activities for **Maury Microwave** through whole Europe, except France and UK. Together with our partners in major regions we provide best solutions in terms of Precision Calibration and Device Characterization.



Sales responsibility and first contact:



HITECH
RF & Microwave solutions

Tel: +31 30 307 4420
Email: admin@hitechbv.nl
Web: <https://hitechbv.nl/>



ELECTRON MEC

Tel: +39 -348-4549939
Email: roberto.radice@electron-mec.com
Web: <http://www.electron-mec.com/>



**ALTAIX
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HTEST

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Web: <https://www.htest.cz/>

For UK and France:

Castle
MICROWAVE

Tel: +44 (0)1635 271300
Email: sales@castlemicrowave.com
Web: <http://www.castlemicrowave.com/>

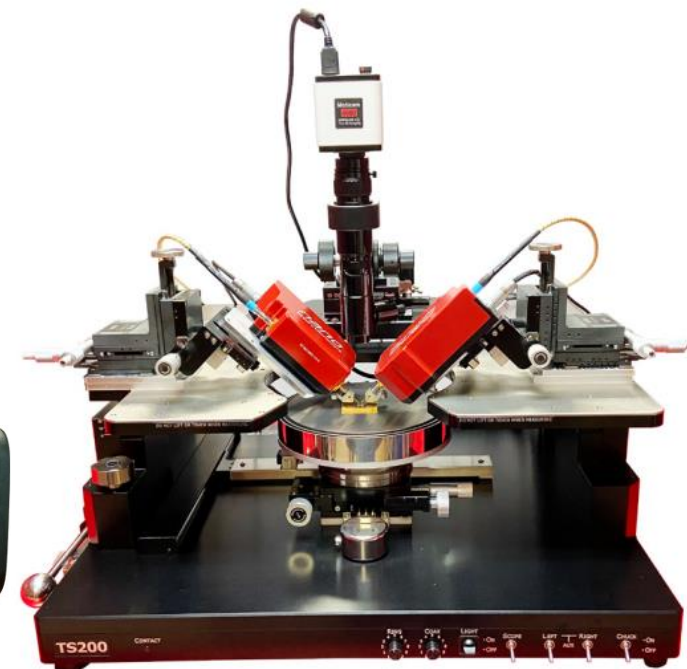
EXOCIS

Tel: +33 (0)5 47 74 42 30
Email: <https://exocis.com/contact>
Web: <https://exocis.com/>

Based in Ontario, California USA and R&D Center at Eindhoven in the Netherlands, Maury offers turnkey characterization solutions including measurement and modeling software, impedance tuners, load pull, T&M amplifiers and noise parameter measurement systems.

Maury Microwave offers:

- Turnkey characterization solutions including impedance tuners, load pull and noise parameter systems
- Calibration Products and Software
- Instrument Amplifiers
- RF Interconnect and Lab Components





Maury Microwave **RF TEST & MEASUREMENT**

Your Calibration, Measurement & Modeling Solutions Partner!

HITECH
RF & Microwave solutions



Boonton

www.boonton.com

Part of Maury and leader in high performance RF and microwave test equipment for radar, avionics, electronic warfare, satellite and wireless communications, and EMI/EMC applications. Used across the semiconductor, military, aerospace, medical and communications industries, Boonton products enable a wide range of RF power measurements and signal analysis for RF product design, production, maintenance and system integration.



Holzworth

www.Holzworth.com

Part of Maury and leader in high-performance phase noise analyzers and signal generators for test and measurement solutions in government, commercial, and academic environments. Optimized for ultra-low phase noise performance, Holzworth products offer fast switching speeds, spectral purity, accuracy, and high reliability while meeting stringent performance specifications in a unique form factor.



Noisecom

www.noisecom.com

Part of Maury and leader of RF and microwave noise sources for signal jamming and impairment, reference level comparison and calibration, receiver robustness testing, and jitter injection. Electronic noise generation.



High density phase coherent source

- High Channel Density in 1U high Instrument
- 32 Channel capability
- Coherent channel to channel
- Same chassis allows for control of variables
 - Ambient Temperature
 - Less External Cabling between units that contributes to Jitter (phase noise)
 - External Pulse modulation from ARBS
 - Less Rack space needed for the channel count

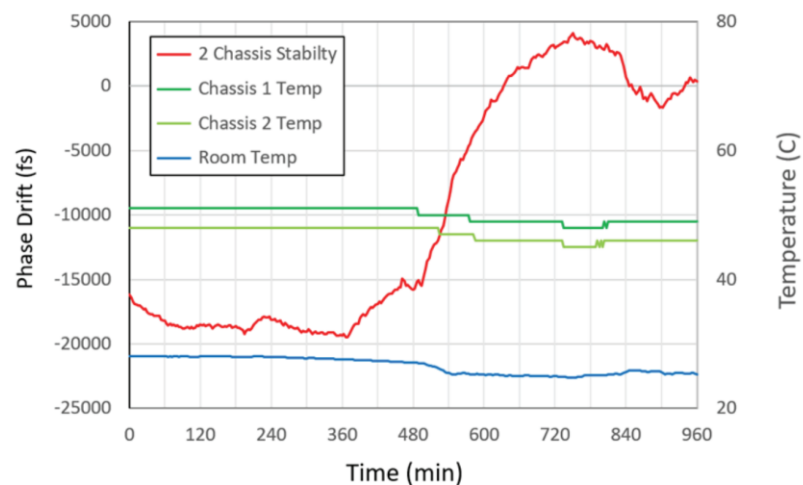


Figure 7: 2 Chassis - 5GHz Relative Phase Stability (16 hrs)

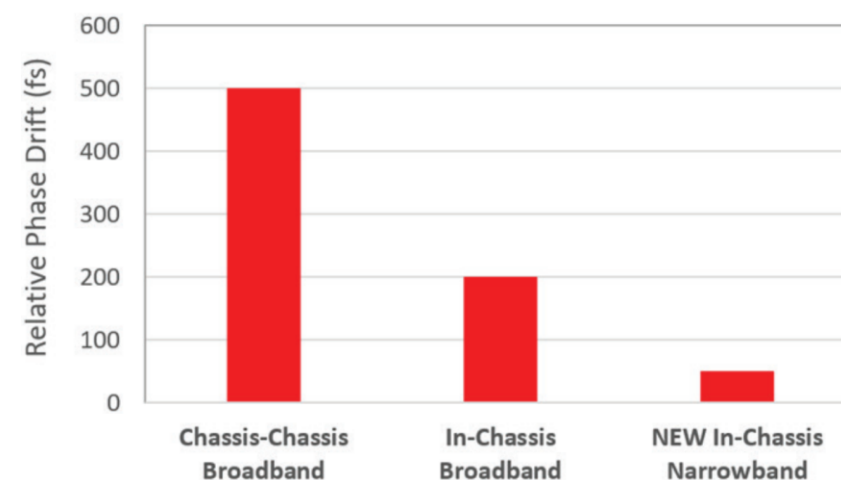


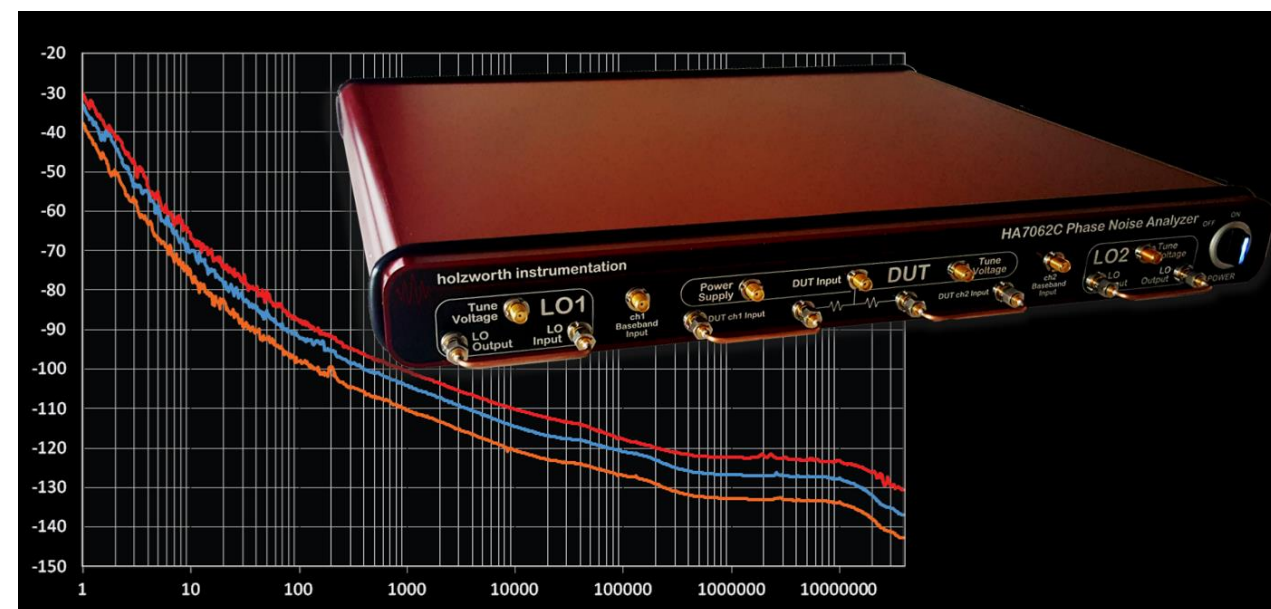
Figure 10: Relative Hourly Phase Drift of Holzworth Signal Sources



KEY SPECIFICATIONS AND FEATURES

- DUT Input: 10 MHz to 26 GHz (option to 50 GHz...or higher)
- Measurement Bandwidth: 0.1 Hz to 100 MHz offsets Measurements: Isolated AM / PM, Baseband, Spurious, Jitter Automated Absolute and Additive (Residual) Measurements
- Real Time Cross Correlation • Outstanding Accuracy
- Ultimate Configurability
- Extremely Fast Measurements from High-Speed, Real Time Dual FFT Engines
- Incorporates Holzworth HSX Synthesizer Cores as Its Internal LO's
- Two General-purpose CW Sources
- Fully Shielded, Fan-Less Compact 1U Chassis

<https://holzworth.com/products/phase-noise-analyzers>





<https://holzworth.com/>



Applications; Quantum Computing



PRODUCTS RESOURCE LIBRARY APPLICATIONS SERVICE & SUPPORT SALES ABOUT

holzworth instrumentation HSY9002A: RF Synthesizer
HSY SERIES
ch 1 10MHz - 20GHz ch 2 10MHz - 20GHz
+ Phase Noise Test
Quantum Computing
Remove Trigger Jitter
LOADED OPTIONS
Synthesizers
ON
POWER

**New HSY Series
Ultra-Low Phase Noise RF Synthesizer** >>

ISO9001 / ISO17025 Multi-Channel RF Synthesis Measure Phase Noise

HSX Series
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HSX SERIES
ch 1
FEATURED PRODUCT

PURE AWESOMENESS
Sub -190dBc/Hz Noise Floors
100MHz Measurement Offsets
±540 Calibration for Accuracy
Blazing Fast Data Acquisition
Best Performance-to-Price Ratio
VIDEOS

NEWS/EVENTS

RESOURCE LIBRARY



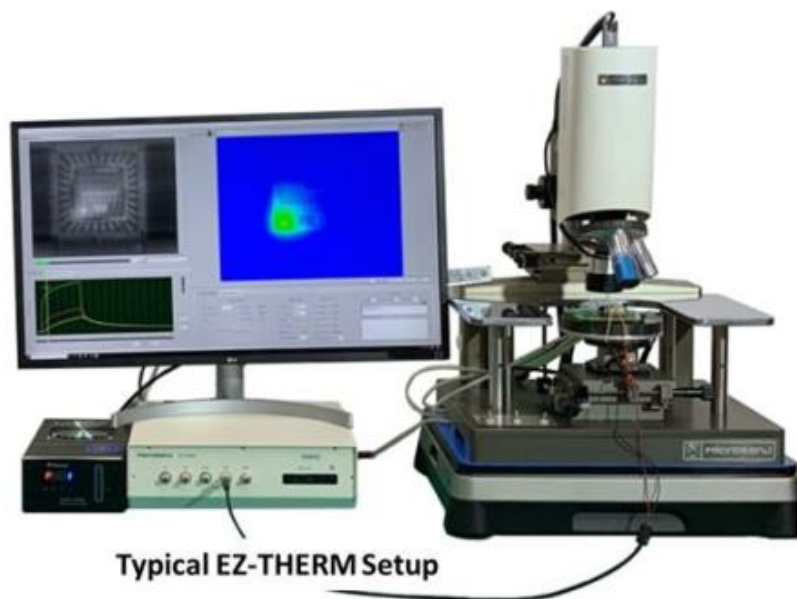
Microsanj

THERMAL IMAGING

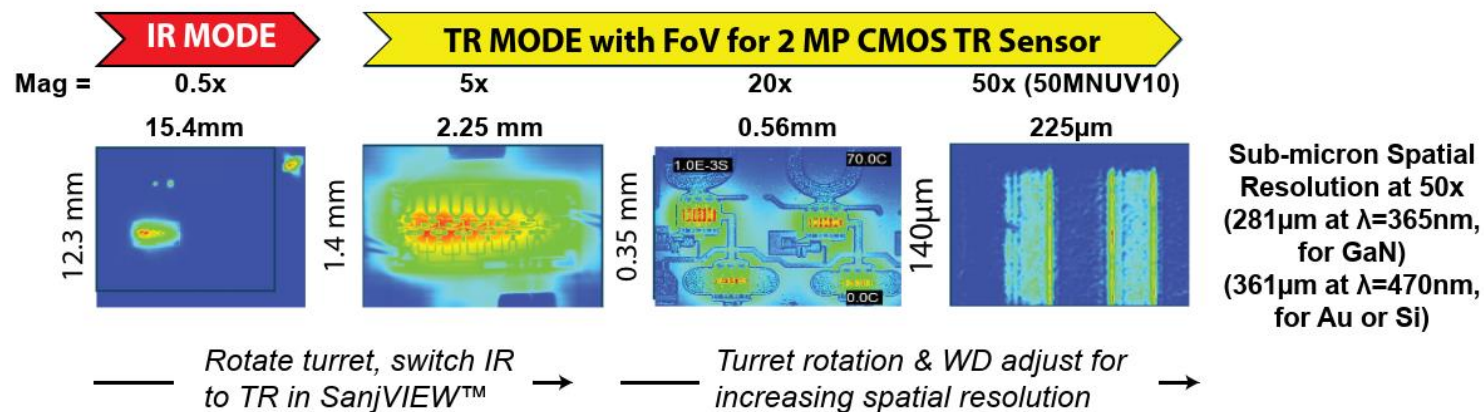
The future of thermal imaging

Based in Fremont, California USA Microsanj is technical leader in the field of high-resolution thermal imaging based on the **thermal reflectance principle**. We are focused on the development of systems, products, and services for microelectronic and optoelectronic device and circuit thermal design and characterization.

Full Spectrum Thermal Imaging



Typical EZ-THERM Setup



Macro-Scale with IR

- Large FoV
- High thermal sensitivity
- Quickly locate hot spot(s)

Micro-Scale with IR

- Zero-in on located hot spots or other thermal anomalies
- with progressively higher spatial resolution
- to further analyze defects & other areas of interest

Easy & quick IR to TR mode transition, Lock-in technique supported for both IR & TR

ERAVANT

MAKING MILLIMETERWAVE ACCESSIBLE

MMWave and RF Test solutions

HITECH

RF & Microwave solutions

For BeNeLux and Scandinavia

Eravant was founded in 2011 as SAGE Millimeter, Inc. by two veterans of the millimeter wave industry. Located in Torrance, California, our team operates from a 60,000-square-foot design, manufacturing, assembly, and testing facility focused on supplying a global customer base with millimeter wave and sub-THz components, subassemblies, and test equipment.

1



Test & Measurement Equipment

2



Calibration & Measurement Services

3



Custom System Applications

4



Millimeter Wave & Sub-THz COTS





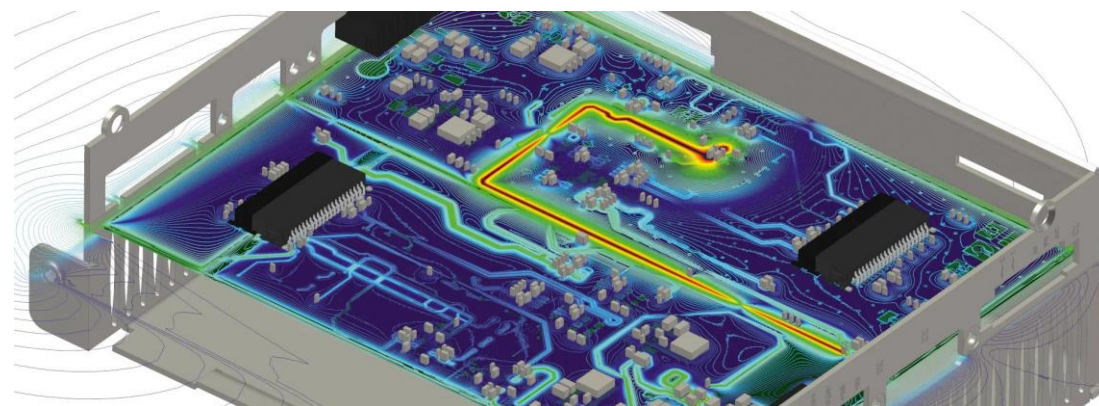
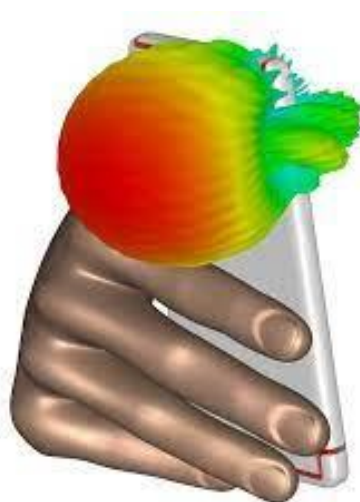
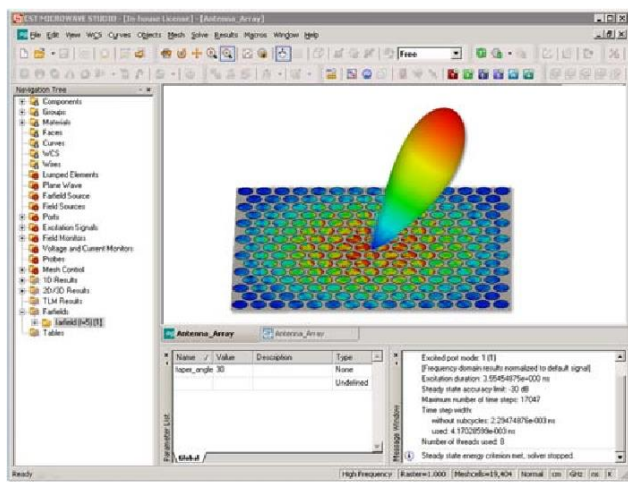
The **3DEXPERIENCE**® Company

RF DESIGN & SIMULATION (EDA Software)

HITECH
RF & Microwave solutions

3D Electro-Magnetic Simulation for

- Antennas,
- EMC,
- Bio-EM,
- Thermal,
- Power / Signal Integrity. (CST STUDIO SUITE & OPERA)





(ONSITE) MEASUREMENT & SIMULATION

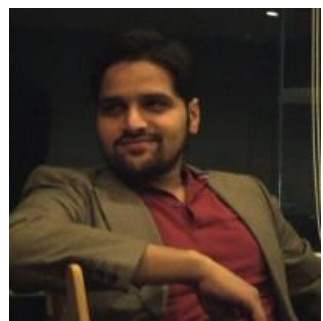
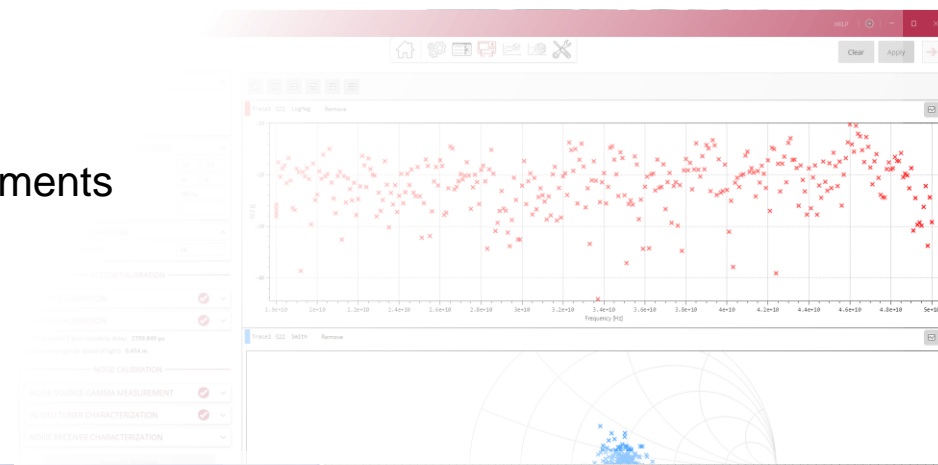
Where measurements or simulations needs to be done. The equipment is available, but nobody is available to get the job done



Ranny Hassoon
Application Engineer

Measurement Services:

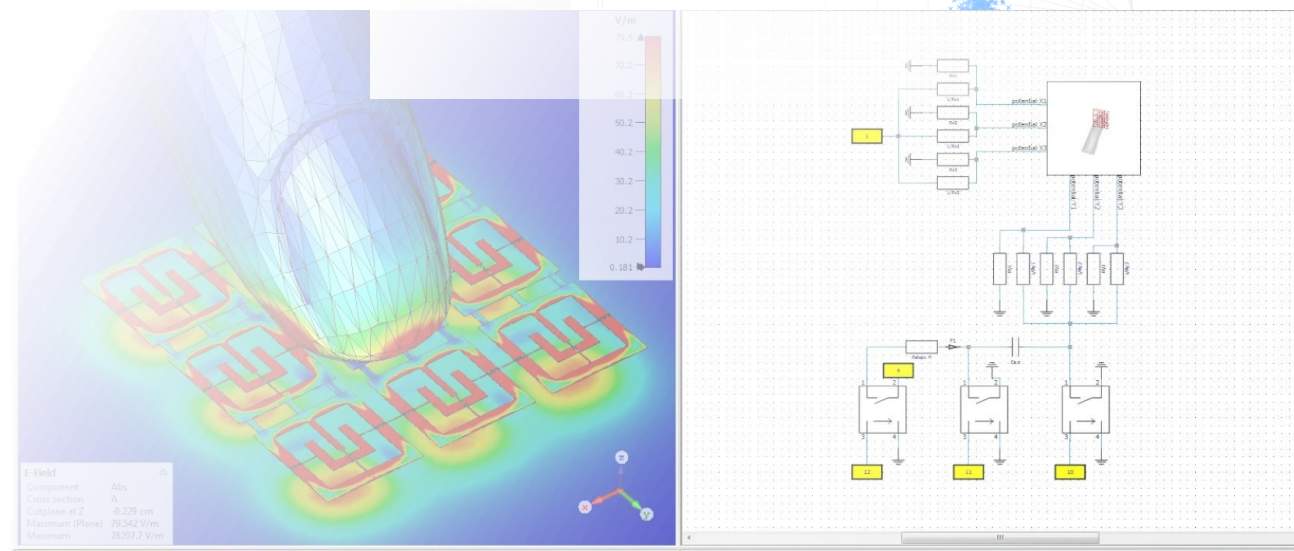
- Pulsed-IV with S-Parameter Measurements
- PA Characterization with Load Pull Measurements
- LNA Characterization with Noise Parameter Measurements
- Tuner Maintenance Servicing
- Thermal Device Characterization (@ Hi-Tech Lab only)



Kamal Mustafa
Application Engineer

Simulation Services:

- Electromagnetic Simulation
- Radar Development





Thank you!

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- **Together with our customers and partners we provide the best “Device Characterization” solutions for the job.**
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- **Hitech’s team delivers consultancy and training for RF design, measurements and simulations.**