

## Dear Z43 Partners, Friends, and Followers

October is here – see what we've been up to! Our latest Newsquarter is now available with updates about the latest activities at Z43. Learn about our key achievements in the last three months and how they can impact your results!

### MEASUREMENT

## TDS-B1: Magnitude and Polarization Measurement in MR Coils

With ZMT's TDS-B1, our customers can measure the amplitude and polarization of MR coils quickly and precisely. Two orthogonal time domain sensor (TDS) probes convert the incident radiofrequency (RF) magnetic field signals from the coil to an optical signal, which is fiber-optically transmitted and opto-electrically converted by the remote units, captured by an oscilloscope, and transmitted to the computer, where the polarization is computed and displayed. The full pulse train can also be seen in the time-domain view. Check out the [video](#) and let us know if you have any feedback or are interested in learning more about TDS-B1/TDS free-space probes!

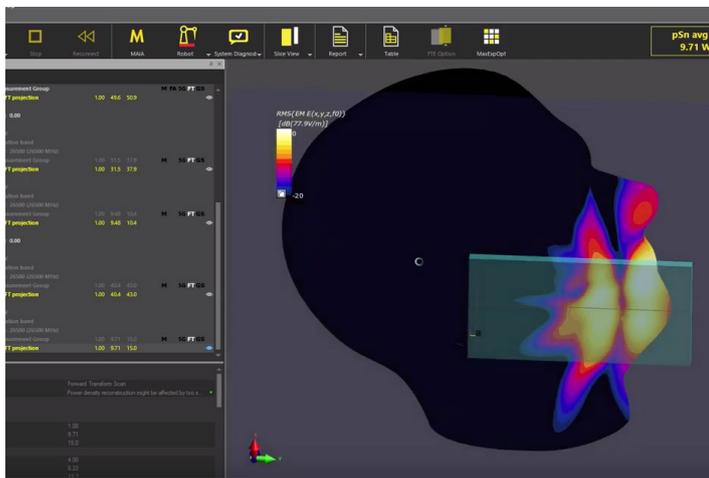


### MEASUREMENT

## Entering a New World with cDASY6 Module mmWave V2.0

It took one idea, two years of focused research, and three dedicated people to make the impossible possible: finding a solution to determine the total field in the half space above the measurement planes from only a few electric field am-

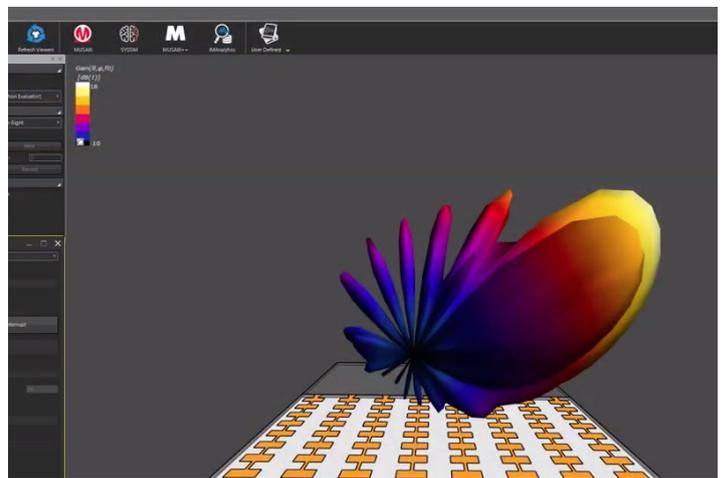
plitude measurements in the very close near-field. And – we did it! The new methods and algorithms are now accessible as “FTE Option” and “MEO Option” stand-alone software packages in the cDASY6 Module mmWave V2.0.



The **FTE (Forward Transform Evaluation) Option** computes the power density (PD) on the SAM Heads or on any other virtual surface from one planar scan at 2 mm distance from the device. Watch the [video!](#)

This is a giant leap forward in mmWave compliance testing as the combination of the two new options not only makes accurate PD compliance testing on the SAM possible, it also saves users weeks of test time!

Please note that an equivalent version of the MEO Option is also available in Sim4Life and SEMCAD X, making



The **MEO (Maximum Exposure Optimizer) Option** computes the maximum PD for complex devices with phased-array antennas from a very limited set of measurements. Watch the [video!](#)

SPEAG the only company globally that offers an advanced simulation package that is closely and smoothly integrated with the industry's leading measurement tool for optimization of devices operated close to the body.

## VIRTUAL POPULATION

### Launch of "SPARC Portal" at ISAN 2019



IT'IS provided an early glimpse into its o<sup>2</sup>S<sup>2</sup>PARC computational neuroscience platform to SPARC investigators and the autonomic neuroscience community at ISAN 2019. o<sup>2</sup>S<sup>2</sup>PARC is an online-accessible simulation platform that is being established to host all computational models developed by SPARC teams and by other neurocentric programs (e.g., the Blue Brain Project) allowing the sharing, execution, and coupling of these models to facilitate *in silico* studies. An early version of o<sup>2</sup>S<sup>2</sup>PARC is now openly accessible via the "SPARC Portal" and includes the first computational and visualization tools provided by selected SPARC researchers, e.g., (i) data and anatomy visualization (e.g., Jeduk V4.0), (ii) artificial intelligence for compound action potential prediction, and (iii) electrophysiology simulations of cardiac myocytes and tissue.

Over time, o<sup>2</sup>S<sup>2</sup>PARC will be updated with the full set of powerful computational neuromodulation modeling functionality of Sim4Life, including functionalities from the recent Sim4Life V5.0 release. For more information on o<sup>2</sup>S<sup>2</sup>PARC, contact us at [info@itis.swiss](mailto:info@itis.swiss).

## VIRTUAL POPULATION

### Implant Safety Evaluation at IT'IS – Episode II: Model Validation Using Test Field Diversity

We have published Episode II of our Implant Safety video series, which explains how we validate our model of the RF response of active implantable medical devices (AIMD) to MRI exposure. In Episode I, we derived these models for both the heating and the voltage response of ZMT's SAIMD-U validation device. This new episode demonstrates the Test Field Diversity method, which lets us test the implant model under a wide range of verified incident field conditions without physically remounting the lead each time. Watch Episode II on [YouTube](https://www.youtube.com/watch?v=...).



## Z43 SOCIAL

### And another PhD for IT'IS



Z43 congratulates Dr. Frederico Teixeira for successfully defending his PhD thesis entitled "Development and Application of a High-Performance Computing Framework for the Realistic Mechano-biological Modeling of Patient-Specific

Aneurysm Disease Evolution". The results of this work provide novel and testable models for prediction of aneurysm development and for evaluations of therapeutic measures.

## MEASUREMENT

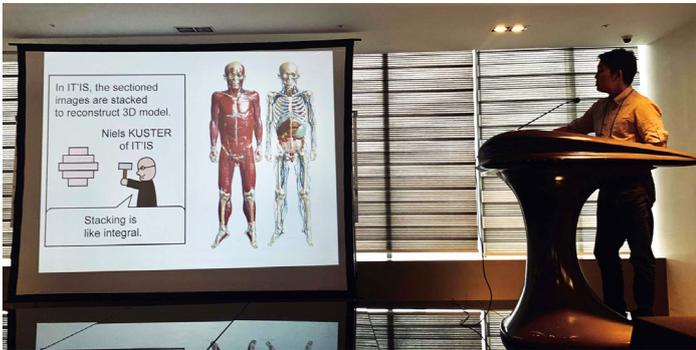
### Specific Ankle Phantom for Dosimetric Evaluations

SPEAG has released the Ankle Phantom, the latest addition to our specific phantom product line. The phantom is designed to demonstrate compliance with specific absorption rate regulatory requirements of devices that operate at the ankle or on the lower leg. It meets all requirements of the IEC/IEEE 62209-1528 standard. Installation and usage of the phantom is demonstrated in this [video](#).



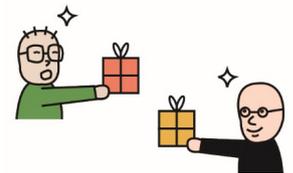
WORKSHOP

## Successful Z43-Dymstec Workshop



Time flies: On September 20, Z43 and DYMSTEC conducted the latest edition of their annual hardware and software workshop in Seoul, South Korea – marking the 20<sup>th</sup> anniversary of this popular event! The workshop attracted a record number of over 180 participants from leading universities, industry, and government agencies who were eager to learn more about our wide range of solutions for overcoming the technical challenges of 5G/wireless

systems, in-/on-body communication devices, wireless power transfer, and emerging medical technologies like electroceuticals. Many thanks to the DYMSTEC-team for the excellent organization!



Z43 SOCIAL

## Z43 Summer Night Party

Our annual Z43 Summer Night Party took place in the beginning of September in not very summery temperatures but still in good spirit! Just as we do every year, Z43 colleagues celebrated the end of the summer with lots of salads and vegetarian options, sausages, and – of course – ice cream.



RESEARCH

## PUBLICATIONS

*Efficient and Reliable Assessment of the Maximum Local Tissue Temperature Increase at the Electrodes of Medical Implants under MRI Exposure*

**A. Yao et al., 2019, Bioelectromagnetics, 40(6):422-433; doi: 10.1002/bem.22208 (online July 19, 2019)**

*Effects of Radiofrequency Electromagnetic Field Exposure on Neuronal Differentiation and Mitochondrial Function in SH-SY5Y Cells*

**N. von Niederhäusern et al., 2019, Toxicology in Vitro, 61: 104609; doi: 10.1016/j.tiv.2019.104609 (online July 24, 2019)**

*Current Directions in the Auricular Vagus Nerve Stimulation II – An Engineering Perspective*

**E. Kaniusas et al., 2019, Frontiers in Neuroscience, 13:772; doi: 10.3389/fnins.2019.00772 (online July 24, 2019)**

*Novel Method and Procedure for Evaluating Compliance of Sources with Strong Gradient Magnetic Fields such as Wireless Power Transfer Systems*

**I. Liorni et al., 2019, IEEE Transactions on Electromagnetic Compatibility; doi: 10.1109/TEM.2019.2924519 (online August 6, 2019)**

*Anatomical Model Uncertainty for RF Safety Evaluation of Metallic Implants Under MRI Exposure*

**A. Yao et al., 2019, Bioelectromagnetics; doi: 10.1002/bem.22206 (online August 8, 2019)**

*Feasibility and Relevance of Discrete Vasculature Modeling in Routine Hyperthermia Treatment Planning*

**K. Sumser et al., 2019, International Journal of Hyperthermia, 36(1), 801-811; doi: 10.1080/02656736.2019.1641633 (online August 27, 2019)**