piX System

Generation of RF Implant Models in Minutes for Demonstrating MRI Safety

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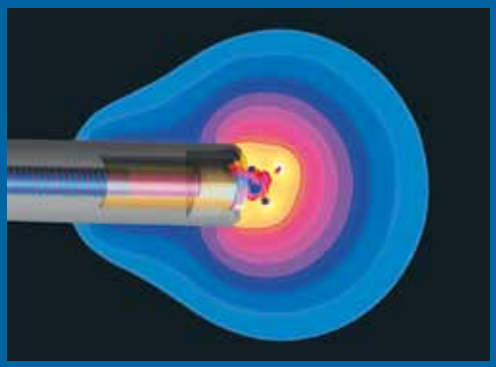
piX analyzer: source & data acquisition unit

Scanning in progress with DASY52NEO (SPEAG, Switzerland)



RF-heating response at implant electrode

Applications

The piX system is the experimental system of choice to generate the numerical piece-wise excitation (piX) model of any implantable medical device. The model is suited to accurately simulate the interaction with the electromagnetic fields during a magnetic resonance imaging (MRI) exam. It is compliant with the Tier 3 procedure of the IEC/ISO TS10974 guideline to demonstrate MRI radiofrequency (RF) safety with respect to tissue damage evaluation and device malfunctions.

piX Specifications

Excitor	
Typical output power	18 dBm
Typical forward and reverse power meter accuracy	0.2 dB
Coupler directivity	> 30 dB

Detector	
Typical noise floor	–78 dBm
Dynamic range	> 60 dB
Typical linearity	0.05 dB
Typical phase accuracy	0.4°
I and Q amplitude balance	0.1 dB

piX Excitors and piX Probes

- Various excitors are optimized for different frequencies and media, generating a locally uniform tangential excitation of <10 mm
- TDS probes are used for isolated measurements (TS10974, Clause 8), eliminating any cross-talk to the excitor and implant under test for full traceability and reproducibility
- RFoF1P4MED probes are used for RF-induced malfunction measurements (TS10974, Clause 15) to determine the RF injection levels or RF radiated field levels

Available piX Excitors and Wideband Probes

- piXE51HPV1: for 51 MHz and high permittivity media
- piXE51LPV1: for 51 MHz and low permittivity media
- piXE64HPV1: for 64 MHz and high permittivity media
- piXE64LPV1: for 64 MHz and low permittivity media
- piXE128HPV1: for 128 MHz and high permittivity media
- piXE128LPV1: for 128 MHz and low permittivity media
- E1TDSz/MRI probe: for 10 – 6000 MHz (ISO17025 calibrated)
- RFoF1P4MED probe: for 10 – 1000 MHz

piX Phantom and Racetrack

- Optimized for evaluation of elongated implants and active implants with one or more leads
- Various probe mounting locations for characterization of implants at different positions
- Materials: the phantom is composed of transparent acrylic glass; the Racetrack is composed of FR4
- Size: 1200 × 240 × 240 mm (L × W × H)

Compatibility

- Smoothly integrates with SPEAG's DASY52NEO measurement system
- piX transfer functions integrated into ZMT's Sim4Life IMAnalytics multi-exposure Tier 3 evaluation tool

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WWW.Z43.SWISS

zmt zurich medtech ag · zeughausstrasse 43, 8004 zurich, switzerland · phone +41–44–245–9765
info@zurichmedtech.swiss · www.zurichmedtech.swiss

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