

Context

In MRI, the E-field assessment is mainly linked to:

- the exposure of people to RF electromagnetic (SAR)
- the design of antennas (body or local coils)

The radio frequencies field analysis is required with a very high spatial resolution over a quite large zone (within the body coil) or a smaller zone like the wrist coil for example.

The measure must be performed under a magnetic field of 1.5, 3, 4.7 Tesla or more depending on the MRI model.

In research labs, the measurements may be performed inside any kind of medium (liquids, phantom, meat, fruits, vegetables, animals...).



MRI system

Existing technical E-field measurement

There are 2 different technologies available on the market today:

- To measure the elevation of temperature inside the phantom in various places (SAR)
- To measure the electric field based on antenna probes inside the phantom in various places. This technic has a limited frequency bandwidth and may interfere with the E-field and the media (SAR and E-field)

Targeted markets

Any manufacturers of research MRI or clinical MRI or research centres involves in assessment of exposition of people to electric fields in MRI systems.

Proposed solution by Kapteos

The electro-optic solution presents the best possible measurement system thanks to:

- A 3 channel OE converter and bio probes
- A non-invasive measurement (no metal part)
- A very compact design (5 mm * 35 mm)
- A very small spatial resolution (< 1 mm)
- An operating temperature from 0 to +50°C for the probe
- The vector measurement of the E- field with excellent rejection ratio of an axis of the field to another (> 50 dB). The measured information is very comprehensive and accurate.
- A MRI compatible probe holder

Customer advantages of using Kapteos solution

To measure very precisely the Specific Absorption Rate (SAR) of people inside **your installed MRI system** (clinical or in lab).

To improve the design knowledge of MRIs.

Kapteos references

- Long terms collaboration with biomedical imaging research laboratory Creatis (FR)
- Several publications issued by Kapteos
- Tübingen Clinic (Germany)
- IADI CHU Nancy (France)
- ESPC Institut Langevin (France)