

Optical Magnetometry for MRI Image Improvement

Medtech & Diagnostics

For Diagnostics and Research



A magnetic field can now be monitored continuously during MRI scans - without any form of interference - since the probe comprises 100 % nonmetallic components.

With high quality temporal data on the magnetic field evolution during an MRI scan, the image can be corrected to be sharper and artefacts can be removed.

This capability finds applications both in MRI research and in general diagnostics.

Technology Description

The device is based on atomic spectroscopy of cesium with resonant laser light. A 3D printed nylon probe contains the atomic vapor cell and the optics necessary to perform precision spectroscopy. The probe is fiber connected so that lasers and electronics can be located remotely from the MRI scanner.

The probe dimensions are 90x33x10 mm³. Several probes can be powered by the same laser, and work is ongoing towards developing a system with four probes for in-situ field monitoring at four separate points in the magnetic field. A signal bandwidth of tens of kilohertz and a resolution of microTeslas has already achieved and can be optimized further. The current system was developed for measurements at 7 Tesla +/- 10 mT, but is easily reconfigured to work at other field strengths above 1 T.

Intellectual Property Rights

A patent application has been filed with the Danish authorities with a priority date of December 14th, 2018, and is now in the PCT phase.

Current State

A prototype with a single probe has already been developed. While expanding the system to four probes, we are working on improving the sensitivity with a view to performing a demonstration of image improvement in MRI during the next 12 months.

Team



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Business opportunity and Call to action

We are looking to make first contact with interested parties and discuss future potential collaborations and partnerships.

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