



Optimal 3.0T Imaging

MultiTransmit technology improves the quality of 3 Tesla MRI imaging

Who

Dr. Johannes Stieß, radiologist with an emphasis on 3 Tesla magnetic resonance imaging

Where

Radiology at the Prinzregentenplatz, Munich

Challenge

Artifacts resulting from high field strengths, which can limit the diagnostic usefulness of MRI images

Solution

MultiTransmit technology with multiple sources, which can transmit simultaneously but independently of each other

Philips MultiTransmit technology from Philips uses multiple RF sources to prevent shadowing in clinical images; it also shortens scan times significantly. Radiology at the Prinzregentenplatz - in Munich - was the first German radiography practice to retrofit its 3 Tesla MRI, a Philips Achieva 3.0T, with the new MultiTransmit technology, and has since benefited from the innovation.

Radiology at the Prinzregentenplatz is among the largest radiological practices in Bavaria. Founded 25 years ago, today it has five locations and the full range of imaging possibilities. The emphases of the practice are investigations of mammary glands, joints, abdomen and the central nervous system.

Since 2006 Radiology at the Prinzregentenplatz has been using 3 Tesla high field equipment, the Philips Achieva 3.0T – making it the first radiology practice in Bavaria to have taken this step. 42-year-old radiologist Dr. Johannes Stieß manages the 3 Tesla site; he supported the practice's decision to retrofit their MRI system with Philips MultiTransmit technology in February 2010, to meet the challenges of high field strength MRI. This makes the practice the first in Germany to upgrade to MultiTransmit.

Multiple sources reduce shadowing and false contrast

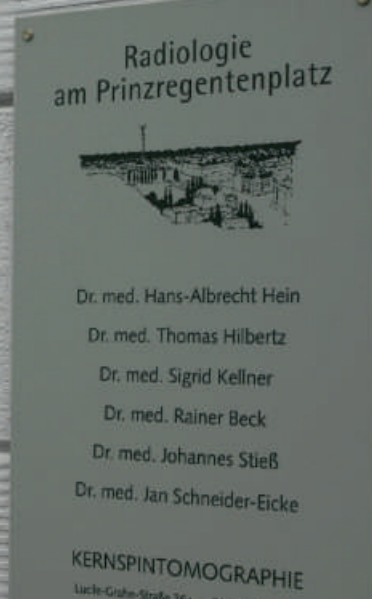
Philips developed and patented MultiTransmit technology to master the challenges of high field strength imaging. MultiTransmit technology enables an MRI

system to transmit the signals needed for imaging from several sources at the same time, but independently of each other. The different transmissions compensate each other to prevent excessive or suppressed signals, which can happen in some body areas. The result is an image with undistorted tissue contrast. MultiTransmit thus ensures a uniform distribution of the signals in the patient and reduces shadowing and the false contrast of anatomical structures that can limit the diagnostic usefulness of MRI images.

"With MultiTransmit, image quality is significantly better"

"Even at our first demonstration of the MultiTransmit technology, it was obvious the image quality was significantly better. This was most noticeable in problematic body regions, which for physical reasons are more difficult to examine at 3 Tesla, like abdomens, mammary glands, spinal columns and hips," reports Dr. Stieß.

PHILIPS
sense and simplicity



Dr. Johannes Stieß in front of the practice in Munich

Consistent and homogeneous images

Another advantage of MultiTransmit is that the multiple sources can be individually adapted to the patient's physique. This means the uniformity and consistency of the images is obtained independently of the anatomy of the patient. Also, the simultaneous use of several sources, rather than just one, prevents "hot spots" (localized warming) which can arise from Absorption of radio waves by internal organs. The scanning time with MultiTransmit is therefore significantly shorter than for conventional 3.0T equipment, which can only avoid hot spots by using longer measurement times.

"Scan times are reduced by up to 30%"

Philips offers this technology as an upgrade for Achieva 3.0T systems. MultiTransmit is included as standard on the newest model of the Achieva series, the Achieva 3.0T TX.

More examinations through shorter scan durations

By the end of April 2010, Radiology at the Prinzregentenplatz had already examined 270 patients using the new MultiTransmit technology. An initial reaction from Dr. Stieß:

"The scanning times are reduced by up to 30% at the same image quality. We save on average 25 to 30% scanning time for spinal column examinations, for example. For breast examinations we only need around 20 minutes, instead of the 30 minutes it took until now." So the shortened scanning times make it possible to examine four more patients a day, on average, than before the upgrade.

"MultiTransmit effectively eliminates signal inhomogeneities, which were a problem until now at 3 Tesla."

More exact images of breast and torso. Examinations of the mammary gland, a focus of the practice, gain from the notable increase in homogeneity of the magnetic field: "The image quality for breast examinations is now constantly and reproducibly better," Dr. Stieß reports. "MultiTransmit effectively eliminates signal inhomogeneities, which were a problem until now at 3 Tesla." Doctor and patient particularly benefit from the imaging of the abdomen: "Until now, we usually carried

out these examinations on our 1.5 Tesla machine. Since retrofitting the MultiTransmit technology, we examine these patients increasingly with the 3 Tesla system, since we can now use the advantages of the higher resolution without the disadvantages of the field inhomogeneities." The radiologist has experienced a similar increase in image quality for examinations around the thoracic spine: artifact overlapping is also notably reduced here.

Flexible and versatile in routine use in the practice

An Achieva 3.0T with MultiTransmit provides more flexibility and versatility. In Radiology at the Prinzregentenplatz the spectrum of indications Dr. Stieß can therefore examine with 3 Tesla MRI has got "fundamentally broader". "In addition, we can now decide, depending on the patient, whether we use the technology for the better image quality as we do, for example, for prostate or hip examinations, or whether we want to benefit from a shortened scan time, which is decisive for patients that cannot lie still for long, because of severe pain."



Achieva 3.0T with MultiTransmit

Confidence for patients and radiologists

Dr. Stieß sees multiple benefits for patients: "The shortened scan times make examinations more comfortable for patients with severe pains. But the decisive advantage is the improved image quality. It increases the confidence of the diagnoses. The more exact the images, the clearer the diagnosis and therapy."

"Diagnosis of critical body regions has become much less problematic."

MultiTransmit also means more certainty for Dr. Stieß personally. "I can now also largely rely on getting consistently good or better scan results for examinations of difficult body regions. The diagnosis of critical body regions, such as mammary glands or abdomens, has become much less problematic."

Acceptable effort, clear benefit

"For Radiology at the Prinzregentenplatz, retrofitting the Achieva 3.0T with MultiTransmit was an exciting advance, which, with the support of Philips went well and with acceptable effort."

"Due to MultiTransmit, we can examine up to 4 more patients per day."

We benefit regularly from the upgrade in the practice, since we can examine up to four more patients a day, thanks to the shortened scan times. And the improved image quality from MultiTransmit amazes my colleagues and myself again and again," says Dr. Stieß. "Inherent difficulties of 3 Tesla imaging are effectively eliminated by MultiTransmit, especially in difficult body regions like the torso and breast."

Advantages of MultiTransmit

- Homogeneous and consistent, high field strength images
- Reduction of shadowing (dielectric artifacts)
- Shortening of scan times by up to 35%
- Increased diagnostic confidence for difficult body regions like abdomens and breasts
- Increased flexibility and versatility for 3 Tesla MRI
- More examinations per day

Availability of MultiTransmit

As an upgrade

Philips offers MultiTransmit as an upgrade for all Achieva 3T systems

As a new system

The new Achieva 3.0T TX is equipped with MultiTransmit as standard

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MultiTransmit technology improves the quality of 3 Tesla MRI imaging

The new model of the Achieva series, the Achieva 3.0T TX, is equipped with this technology as standard.



Please visit www.philips.com/AchievaTX



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