# CONCOMITANT FIELD EFFECT COMPENSATION IN DIFFUSION-WEIGHTED MAGNETIC RESONANCE IMAGING

Ref-Nr: TA-B79062

## HINTERGRUND

Magnetic field gradients are used in magnetic resonance tomography (MRT) to encode the spatial position of the spin magnetization. They can be used to make diffusion processes visible. Maxwell fields, also called concomitant fields, are physically unavoidable side effects, which occur during the generation of magnetic field gradients. The concomitant fields may cause a displacement of the k-space signal and result in dephasing in the layer plane, image blur and signal loss.

## LÖSUNG

The present invention is based on using oscillating gradients to compensate for the concomitant field effect, wherein the oscillating gradients are realized in such a way that only little or no (perceptible) impairment of the desired diffusion weighting or MRT imaging occurs. The technology can be used in connection with a large number of different methods from the field of diffusion-weighted magnetic resonance tomography, for example in connection with methods from the field of double diffusion-weighted magnetic resonance tomography ("double diffusion encoding"). Thus, artifacts like through-slice dephasing, image blurring, and signal loss are mitigated while at the same time, the echo time does not have to be extended, ensuring high signal and unchanged measurement times.

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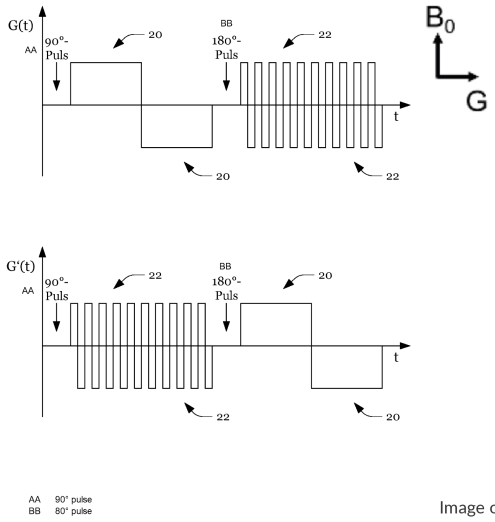
## ENTWICKLUNGSSTAND

Machbarkeit

## CATEGORIES

//Elektronik und Elektrotechnik //Mess- und Regeltechnik //Physikalische Technik




AA 90° pulse
BB 80° pulse

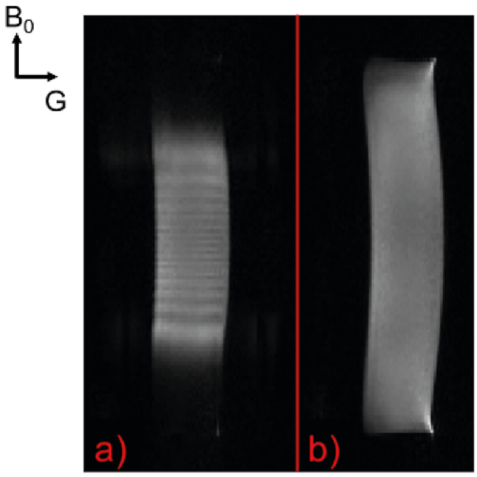



Image of a water phantom
a) artifact through Maxwell-fields (signal loss at the border)
b) with inventive compensation-method
(signal loss mitigated)

## ANWENDUNGSBEREICHE

Improved MRT Imaging through software