

# 32-Channel Phased-Array Head Coil for 1.5T and 3T

Jörg Stapf

Siemens Medical Solutions, Erlangen, Germany

## Introduction

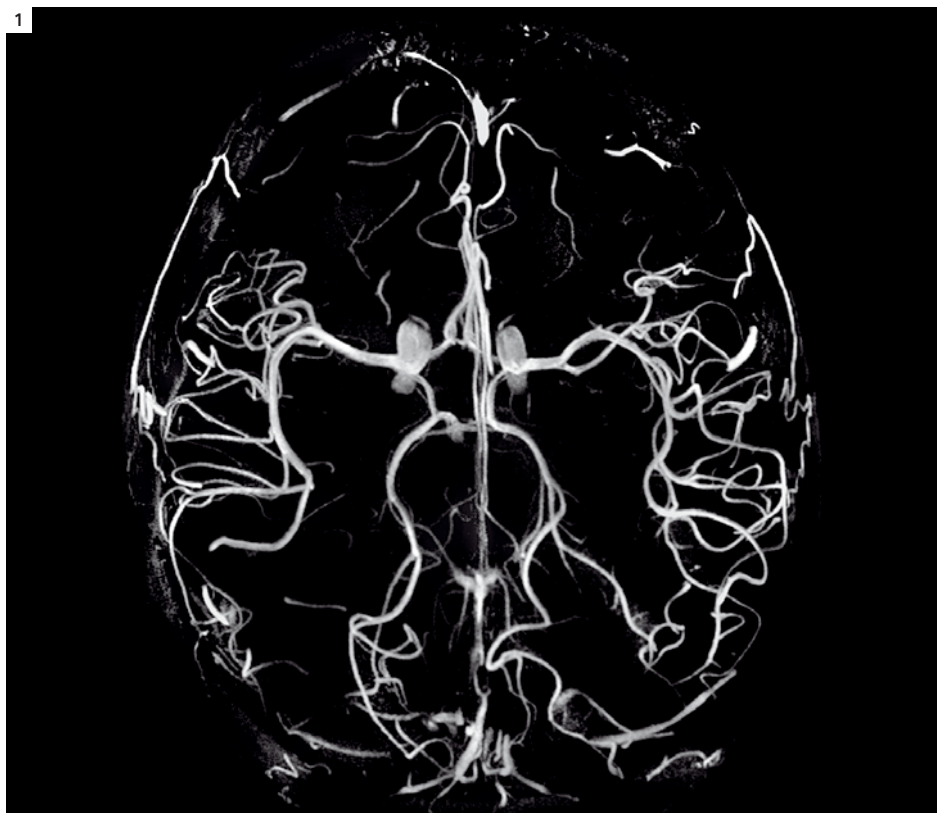
The new 32-channel head coil comes with highly increased signal-to-noise-ratio (SNR) as well as an excellent performance of parallel imaging (iPAT).

## New design

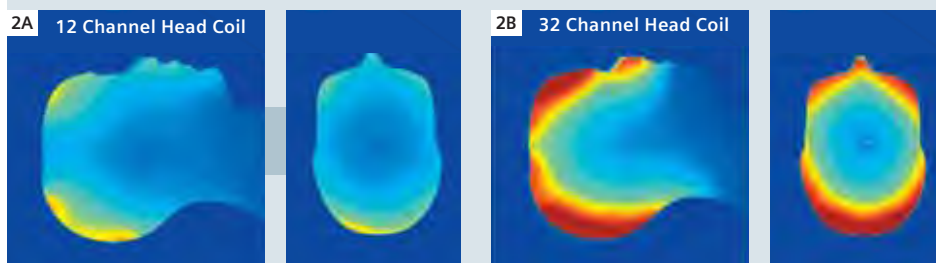
The head coil contains 32 elements with 32 integrated amplifiers which are close to the antenna loops in order to minimize signal loss and to achieve a compact design for 1.5T and 3T systems respectively. The housing is separable, the upper part is designed with 12 elements and can be removed for a stand-alone use of the 20 elements lower part, e.g. for highly claustrophobic patients. A comfortable open view has been established for monitoring the peripheral cortex and for visual stimulation experiments included in fMRI examinations.

## New features

By reducing the coil size (sensitivity volume) and enlarging the number of coil elements (overlapping of sensitivity volumes) as well as the number of channels the SNR is strongly increased [1]. Compared to the standard 12-channel head coil the SNR of the 32-channel head coil is approx. 20% better at the center of the brain and at least 2-fold better at the cortex (Fig. 2). The 32-channel head coil usable for all kinds of head imaging also with iPAT, but it is especially designed for high resolution imaging, functional MR imaging (fMRI), MR angiography (Fig. 1) and Diffusion Tensor Imaging (DTI).



**1** 3T (MAGNETOM Verio) MR angiography with a 32-channel head coil.



**2** SNR distribution of a 1.5T system. **2A** Measurement of a head phantom transversal and sagittal with a 12-channel head coil. **2B** Measurement of a head phantom transversal and sagittal with a 32-channel head coil.

References 1 M.A. Bernstein et al.; Handbook of MRI Pulse Sequences, page 522, 2004, USA.