

# Dual channel EPR excitation coil array for Overhauser-enhanced MRI

## Abstract

This article describes the development of a two-channel surface coil array for Overhauser-enhanced magnetic resonance imaging (OMRI) with the aim of extending the visualization area. The surface coil array consists of two independent surface coil resonators and PIN-diode switches. We utilized the PIN-diode switch to decouple the surface coils. OMRI measurement using a surface coil array was sequentially performed by switching the channels. To evaluate the effectiveness of the surface coil array, we demonstrated OMRI measurements using a phantom filled with nitroxide solution. In addition, in vivo OMRI imaging with a mouse was performed to demonstrate the applicability of our surface coil array to in vivo measurements. As a result, the visualization area obtained with our surface coil array was extended approximately 2-fold compared to the conventional single surface coil. Furthermore, we showed that in vivo imaging with the surface coil array was possible. These results indicate that the surface coil array could enhance the applicability of OMRI imaging.