

Design of Body RF Coil with Multiple Strips for Open MRI System by  
Pseudo Electric Dipole Radiation

김경락\*\*\* · 류승학\*\*\* · 류연철\* · 양형진\*\* · 오창현\*\*\*\*

\*고려대학교 전자및정보공학과, \*\*고려대학교 물리학과, \*\*\*고려대학교 의공학협동과정

**목적** : The purpose of this study is to optimize the configuration of body RF coil composed of 4 planar subcoils for low field open MRI.

**대상 및 방법** : Our low field RF coil is composed of 4 subcoils assumed to be located at both the bottom and top sides of permanent magnet. Each subcoils has 3 main strips. The coil system has mirror inversion symmetry. First, the currents on the strips are obtained by inductance calculation and circuit analysis, Second, all the strips are divided into line strip elements across the strips, the self inductances of line strip elements and the mutual inductances among the line strip elements are calculated, and current distributions of strip are obtained by circuit analysis, where each strip is considered as parallel combination of line strip elements. Finally all the line strip elements are segmented, magnetic field has been calculated by pseudo electric dipole radiation method, where the current elements are regarded as pseudo electric dipole radiation sources. We have performed above procedures for various configurations of RF coil. The field homogeneity is calculated in the 25 cm DSV.

**결과** : The RF frequency dependance of the current distribution across the strip is negligible. The current densities on the strip edges are about two times of that on the middle. The current density on inner edge path of the loop is larger than that on the outer edge path. The proposed RF coil shows field inhomogeneity below 0.85 dB in 25 cm DSV.

**결론** : Proposed field calculation method is very useful to optimize RF coil which has large size and wide strip.