

**Preliminary Result of Whole-body Slotted Tube Resonator for 3.0T MRI**

**Kyoung-Nam Kim • Bu-Sick Park • Sung-Taek Chung**  
MRI Research Center, Medinus Co.

**목적** : 3.0 Tesla whole-body resonator provides a potential to have significant increase in image quality and resolution in high resolution application such as cardiac, spine and extremity imaging. The aim of this study is to design an optimized 3.0T whole-body coil to produce high sensitivity and quality using slotted tube resonator.

**대상 및 방법** : Each orthogonal resonant mode has independently excited by two coupling coils. Independent tuning and matching adjusting for each orthogonal resonant mode were simply performed. The width of each of four horizontal bands covers approximately a 40° arc; therefore, the optimized window angle for the slotted tube resonator is 50°. Quadrature field is the superposition of two orthogonal, oscillating linear fields generated by two electrically and geometrically orthogonal co-frequency resonant modes of the coil. For quadrature excitation a cylindrical coil typically has four-fold symmetry with respect to its center (Z) axis. The number of axial elements required for quadrature operation must be an integral factor of four. To excite a quadrature resonance, two voltage sources are attached to the coil separated by  $\pi/2$ .

**결과** : The proposed STR whole-body coil is found to be more suitable for high frequency operation than the ring resonator coil. The electric losses and corresponding frequency shifts are found to be significantly smaller. The inductive loss was satisfactorily described. Expressed in terms of a series resistance, these losses are proportional to the electric conductivity of the sample and to the fourth power of the sample diameter.

**결론** : STR coil can be available in MRI applications, especially at high frequencies and with electrically conducting samples. In the future, whole-body using detuning systems will be adequate decoupling from a receive-only surface coil. The use of a detuning transmission line body coils will enable full utilization of the inherent increased SNR of the high field MRI system for whole body imaging.