Split Birdcage Coil for Magnetic Resonance Imaging and Spectroscopy

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Technology description

Magnetic Resonance Imaging/Spectroscopy (MRI/MRS) has found wide applications in clinical diagnosis as well as biomedical research. To observe a nucleus other than hydrogen (typical MRI or MRS), e.g. phosphorus or carbon, a dual-tuned coil is needed. The current commercially available dual-tuned volume coils are very hard to make due to complicated, iterative tuning/matching procedures, which impedes wide applications of multinuclear MRI/MRS. This invention relates to an easy-to-use, newly designed coil that allows for simultaneous multinuclear measurements and can be readily adapted for use in conjunction with existing MRI/MRS equipment.

Building upon a split birdcage design, the inventors developed a novel design that provides for strong coupling along the z-axis, large multinuclear sampling volume, use of inductive coupling between the coils, and full use of all of the legs in the said coil. The design includes additional features such as two quadrature couplers, multi-component matching circuits and phase shifters, non-magnetic coaxial cable, and a protective plastic shell.

William Potter, Luning Wang, Kevin McCully, and Zhao Q.*. Evaluation of a New ^{1}H/ ^{31}P Dual-Tuned Birdcage Coil for ^{31}P Spectroscopy" Concepts in Magnetic Resonance Part B Volume 43, Issue 3, pages 90 - 99, August 2013

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