MULTIPHOTON MAGNETIC RESONANCE IMAGING

Tech ID: 31629 / UC Case 2020-039-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,072,402	08/27/2024	2020-039

BRIEF DESCRIPTION

UC Berkeley researchers have developed novel imaging techniques with the use of a multiphoton magnetic resonance imaging apparatus. By taking a particular rotating frame transformation the researchers found that multiphoton excitations appear just like single-photon excitations and can also use concepts explored in standard single-photon excitation. One prototype included a low frequency coil while another prototype included no additional hardware but instead used oscillating gradients as a source of extra photons for excitation. The methods and multiphoton MRI can be used to transform a standard slice selective adiabatic inversion pulse into a multiband version without modifying the RF pulse itself. The addition of oscillating gradients creates multiphoton resonances at multiple spatial locations and allows for adiabatic inversions at each location.

ADVANTAGES

Excitation needs not be bound to the Larmor frequency, which opens doors to RF pulse design beyond the usual filter design and the potential for further imaging innovations.

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INVENTORS

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OTHER INFORMATION

KEYWORDS

MRI, imaging, multiphoton, selective excitation

CATEGORIZED AS

» **Imaging**

» Medical

» **Medical**

» Imaging

RELATED CASES

2020-039-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Frequency Programmable MRI Receive Coil
- Tumor Infiltration Detection And Cell Density Mapping
- Any-Nuclei Distributed Active Programmable Transmit MRI Coil

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