Novel transmitter designs for magnetic resonance imaging

Aussenhofer, S.A.

Stellingen behorend bij

het proefschrift

NOVEL TRANSMITTER DESIGNS FOR MAGNETIC RESONANCE IMAGING

door

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1. Dielectric resonators are new promising RF coils for human magnetic resonance imaging. (this thesis)

2. Efficient RF coils can be build for human high field magnetic resonance imaging using water as a dielectric. (this thesis)

3. Dielectric resonators can be used for human magnetic resonance imaging at 7.0 tesla field strength systems. (this thesis)

4. Dielectric resonators working in the TE mode behave similar to loop coils and a multitude of them can be used together to form an array for cardiac imaging at high field magnetic resonance imaging. (this thesis)

5. A plasma can be ignited and sustained in a static 7.0 tesla magnetic field to form a switch-able RF coil for magnetic resonance imaging. (this thesis)

6. High permittivity materials can significantly change the distribution of magnetic and electric fields within the sample. (adapted from A. G. Webb. Concepts in Magnetic Resonance Part A 2011, 38A(4), p. 148–184.)

7. The magnetic field distributions of dielectric resonators can be visualized by MRI. (adapted from H. Wen et al. Journal of Magnetic Resonance. Series B 1996, 110(2), p. 117–23.)

8. Dielectric resonators can be combined with conventional coils for human 1H / 31P MRI at 7T reducing the coupling considerations in other formulations of double tuned coils. (adapted from R. Schmitt et al. IEEE Transactions on Biomedical Engineering 2016, 9294(c))

9. If you want to be at the frontier of science, you have to pay!

10. Should be fine. (A.G.Webb)

These propositions are regarded as opposable and defendable, and have been approved as such by the promotor prof. dr. A.G. Webb.