Technical report 300-QV-002 On 300 MHz quadrature volume coil for rodent head imaging in vivo

Volotovskyy, Vyacheslav; Tomanek, Boguslaw

https://doi.org/10.4224/17712980

August 5, 2010

Institute for Biodiagnostics

National Research Council Canada

For: Dr. Richard Buist, University of Manitoba

Technical report 300-QV-002

On 300 MHz quadrature volume coil for rodent head imaging *in vivo*

Vyacheslav Volotovskyy and Boguslaw Tomanek

This technical report includes:

- description of the coil (page 2)
- schematics of the coil (Fig. 1)
- photo of the coil (Fig. 2)

The probe for a mouse head *in vivo* MR imaging incorporates a quadrature inductively coupled volume RF coil. RF resonator (eight element low pass bird cage) is embedded into the shielded matching/tuning assembly 80 mm long. RF system has adjustable tuning and matching. Inner diameter of the resonator is 24 mm, its length is 30 mm. Coil elements are made of 6 mm wide adhesive copper tape attached to the acrylic pipe. 6.8 pF capacitors are used to achieve a 300 MHz resonance frequency.

Total length of the set-up is about 80 mm, its outer diameter is approximately 77 mm. Inductive matching network is employed to connect resonator with a quadrature hybrid. 300 MHz floating cable trap is employed to reduce braid currents in RF cables Unloaded Q value for the coil is about 300. Quadrature isolation for an empty coil is better then 30 dB. Quadrature isolation for a loaded coil is better then 20 dB.

Fig.1. Schematics of the coil

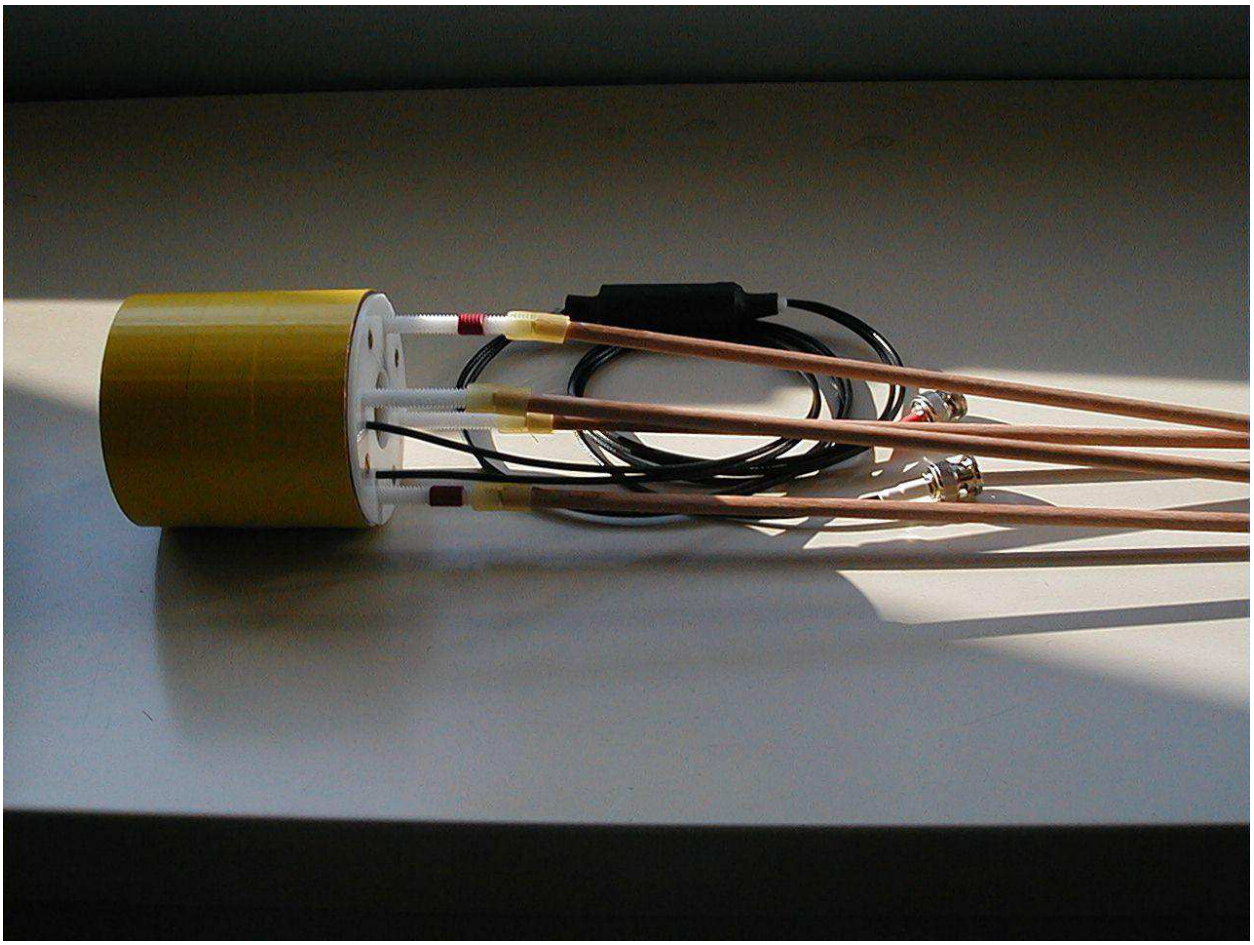

Fig.2. Picture of the set-up.