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## **Means and Methods to Produce Flexible MRI Circuits**

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Technology currently exists to produce Flexible Optical Circuits (FOC). This technology can be utilized to produce MRI Flexible Circuits, (MRIFC). First of all optical fibers might be useful for determining the magnet field strength of the coil, but would be useless for the MRI application. Substituting metal wires for the fiber optic fiber would be one possible solution but metal wires have a tendency to become very hot in fluctuating magnetic fields. I propose substituting hollow plastic tubing for the fiber optic fibers in the flexible circuits. We would then circulate a conductive fluid (saline water perhaps) in the MRIFC to remove the heat build up and maintain the electrical continuity of the pick up coil. Metal tips at the end of the MRIFC would provide the electrical contacts for the coil circuit. Standard one-way check valves would provide the electrical isolation from the pump and reservoir to keep image artifacts to a minimum. Continuous fluid flow would not provide electrical isolation and may cause unwanted image artifacts. So intermittent flow would most likely be used. The plastic housing and disk of the Standard one-way check valves would hopefully close off the electrical path when fluid flow is halted.

### **SPECIFICATION**

Substitute hollow plastic tubing for the metal wires in the MRI flexible circuits. Then circulate a conductive fluid (saline water perhaps) in the MRI Flexible Circuits, MRIFC, to remove the heat build up and maintain the electrical continuity of the pick up coil.

Metal wires have a tendency to become very hot in fluctuating magnetic fields. This is a safety and patient comfort concern.

A flexible circuit would allow the coil to conform around the body part under test. One size fits all concept. The closer the coil is to the subject tissue under test the better the image resolution.

The most important application of this invention is the conformal application to the anatomy. Coils could lay directly on the abdomen or be wrapped around an arm or leg.