

HF-FILTER FOR HYBRIDHYPERThERMIa

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Using an MRI for non invasive thermometry is a suitable tool to control an hyperthermia treatment. The problem is the decoupling of the radiofrequencies used for hyperthermia and for simultaneous imaging without noise. Due to the electromagnetic interferences and different hyperthermia applicators, up to three different frequencies had to be filtered.

The BSD-2000 3D MRI system used at Charité Medical Center has a fixed treatment frequency of 100 MHz with a power of 1800W maximum. Using high power levels leads to a subharmonic signal inside the body coil tuning box of the MRI with 50 MHz, which has also to be filtered for proper imaging. A second capacitive hyperthermia system for local purpose uses a third frequency of 13,56 MHz working with 150 W maximum.

The filtering has to be done in the power path of the MRI. Only 4,5% signal attenuation for 63,5 MHz is acceptable in this part for normal imaging with the MRI.