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Optimization of sensing coil geometry for low-field SQUID MRI and MEG.¹ KONSTANTIN PENANEN, BYEONG HO EOM, INSEOB HAHN, Jet Propulsion Laboratory/California Institute of Technology — The performance of low-field MRI and MEG systems critically depends on the noise-limited sensitivity of the SQUID input subsystem. Optimization tradeoffs between the sensing coil field sensitivity, extraneous field rejection and self-inductance, as well as geometrical and fabrication constraints need to be considered. In addition to coil geometry optimizations, it is beneficial to optimize the shape of the wire loops the coil is wound with. We present the results of such optimization study in configurations typical for SQUID MEG and MRI sensing coils. A significant improvement over the circular cross-section wire can be achieved when flat washer wire is used.

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