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Christian Gerhards* (gerhards@mathematik.uni-kl.de), TU Kaiserslautern, Department of Mathematics, Geomathematics Group, PO Box 30 49, 67653 Kaiserslautern, Germany. *A Spatially Oriented Approach to Geomagnetic Modeling.*

We present some recent applications of multiscale methods to the modeling of Earth's magnetic field. More precisely, we construct regularized convolution kernels for the separation of vector fields with respect to interior and exterior sources, as well as for the reconstruction of tangential current systems. Main ingredient for the kernels are Green's function for the Beltrami operator and the single layer kernel. This offers the possibility of a multiscale decomposition with locally supported wavelets. We mention both a globally reflected approach that requires global information for a first trend approximation and a locally reflected approach where the necessity of global information is substituted by boundary values with respect to the spherical subdomain under consideration. (Received September 07, 2010)