1056-65-513 **Michel Volker*** (michel@mathematik.uni-siegen.de), Geomathematics Group, Department of Mathematics, University of Siegen, 57068 Siegen, Germany. *Regularization of Inverse Magnetoencephalography by a Spline Method.*

Inverse Magnetoencephalography focusses on the determination of the electric currents inside the brain out of data of the magnetic field at the skin. It is well-known that this inverse problem is not uniquely solvable. Therefore, certain constraints have to be imposed on the geometry and the currents for a unique solution. Moreover, data are only given at approximately a hemisphere such that global spherical methods (such as expansions in spherical harmonics) are not appropriate. This talk discusses a particular simplified layer model of the brain. Based on this modelling, a reproducing kernel based spline method (which is related to established techniques in signal processing) is used to regularize the inverse problem. One particular feature of the method is that an almost real-time calculation of the solution is possible. The numerical results show that close approximations to the exact solution can be obtained, even for noisy data.

References

[1] A.S. Fokas, V. Michel: Electro-magneto-encephalography for the three-shell model: numerical implementation for distributed current in spherical geometry, preprint NI09031 of the Isaac Newton Institute for Mathematical Sciences, 2009. URL: http://www.newton.ac.uk/preprints/NI09031.pdf

(Received September 11, 2009)