1078-41-309 **Christian Rieger*** (rieger@ins.uni-bonn.de), Wegelerstr. 6-8, 53115 Bonn, Germany.

Regularized reconstruction imposing sparsity constraints. Preliminary report.

The main focus of this talk lies in the error analysis of regularized reconstruction algorithms. We discuss the reconstruction of an unknown function from a finite number of samples. Given an a priori chosen trial space, the reconstruction problem can be reformulated as a finite dimensional optimization problem, namely to find a vector representing an element from the trial space which fits best the unknown function. We propose an optimization problem based on the well-established compressed sensing techniques. In order to obtain well-posedness of the optimization problem, one needs certain properties of the trial space. It is known in the literature that spherical harmonics fit well into this framework and fulfill the necessary conditions.

In order to show convergence results for the function reconstruction, we need a quantification of the fact that small residuals of the algorithm imply small errors of the reconstruction process. This quantification is for the regularized reconstruction methods provided by sampling inequalities.

This is partly based on joint works with Barbara Zwicknagl. (Received December 12, 2011)