1108-43-556 **Alex Cloninger** and **Wojciech Czaja***, Department of Mathematics, University of Maryland, College Park, MD 20742, and **Ariel Hafftka**. *Solving Fredholm integrals from incomplete measurements.*

We present an algorithm to solve Fredholm integrals of the first kind with tensor product structures, from a limited number of measurements with the goal of using this method to accelerate nuclear magnetic resonance (NMR) measurements. This is done by incorporating compressive sampling type arguments to fill in the missing measurements using a priori knowledge of the structure of the data. In the first step, we recover a compressed data matrix from measurements that form a tight frame, and establish that these measurements satisfy the restricted isometry property (RIP). In the second step, we solve the zeroth-order regularization minimization problem using the Venkataramanan-Song-Huerlimann algorithm. We demonstrate the performance of this algorithm on simulated data and compare it with other sampling techniques. (Received January 20, 2015)