1108-35-150 **Mark Hubenthal*** (hubenjm@math.uh.edu), University of Houston, Department of Mathematics, 641 PGH, Houston, TX 77204-3008, and **Daniel Onofrei** (onofrei@math.uh.edu), University of Houston, Department of Mathematics, 641 PGH, Houston, TX 77204-3008.

Sensitivity analysis for active control of the Helmholtz equation.

We consider the problem of active exterior cloaking for the Helmholtz equation. The previous work of Onofrei implies the following: Suppose we have a source region $D_a \subset \mathbb{R}^d$ ($d = \overline{2,3}$) and a solution u_0 to the homogeneous scalar Helmholtz equation in a set containing the control region $D_c \subset \mathbb{R}^d$. Then there exists an infinite class of boundary data on ∂D_a such that the radiating solution to the corresponding exterior scalar Helmholtz problem in $\mathbb{R}^d \setminus D_a$ will closely approximate u_0 in D_c, while having vanishingly small values beyond a sufficiently large "far-field" radius R.

In this work we study the minimal energy solution to the above problem, which is obtained using Tikhonov regularization and the Morozov discrepancy principle, and we perform a detailed sensitivity analysis. That is, we analyze the stability of the the minimal energy solution with respect to measurement errors as well as the feasibility of the active scheme (power budget, accuracy, stability) depending on: mutual distances between the antenna, control region and far field radius R, regularization parameter, frequency, location of the source, etc. (Received January 08, 2015)