1014-47-774 **Beth M. Campbell Hetrick*** (bcampbel@brynmawr.edu), Bryn Mawr College, Department of Mathematics, 101 N. Merion Avenue, Bryn Mawr, PA 19010-2899. *Continuous Dependence Results for Inhomogeneous Ill-Posed Problems.* Preliminary report.

When observing and studying natural processes, we develop mathematical models that describe these phenomena. This modeling introduces errors that are reflected mathematically by perturbed differential equations. A fundamental problem is to determine some type of bound, or "continuous dependence on modeling," for these errors. We prove Hölder-continuous dependence results for the difference between solutions of certain ill-posed and approximate well-posed inhomogeneous partial differential equations in Hilbert space. Using semigroup theory and operator theoretic methods, we study the inhomogeneous Cauchy problem $\frac{du}{dt} = Au(t) + h(t)$, $u(0) = \chi$, $0 \leq t < T$; where A is a positive self-adjoint operator on a Hilbert space H, $\chi \in H$, and $h : [0, T) \to H$. For a suitable function f, the approximate problem is given by $\frac{dv}{dt} = f(A)v(t) + h(t)$, $v(0) = \chi$. Under certain stabilizing conditions, we prove that $\|u(t) - v(t)\| \leq C\beta^{1-\frac{t}{T}} M^{\frac{t}{T}}$, where C and M are computable constants independent of β and $0 < \beta < 1$. These methods are then used to extend our results to Banach space, where $-A$ is assumed to be the infinitesimal generator of a holomorphic semigroup. (Received September 23, 2005)