1056-46-1261 **Matthew A. Fury*** (`mfury@brynmawr.edu`). *Continuous Dependence Results for Ill-posed Evolution Problems in a Banach Space.*

We prove Hölder-continuous dependence results for the difference between certain ill-posed and well-posed evolution problems in a Banach space X. We consider the ill-posed evolution problem

$$\begin{aligned} \frac{du(t)}{dt} &= A(t,D)u(t) \qquad 0 \leq t < T \\ u(0) &= \chi, \end{aligned} \tag{1}$$

where iD is the generator of a bounded strongly continuous group on X, and $A(t,D) = \sum_{j=1}^{k} a_j(t)D^j$ with $a_j \in C([0,T]:\mathbb{C})$ for each $1 \leq j \leq k$. We determine families $\{f(t,D)\}_{t\in[0,T]}$ of operators in X such that the problem

$$\begin{aligned} \frac{dv(t)}{dt} &= f(t,D)v(t) \qquad 0 \leq t < T \\ v(0) &= \chi \end{aligned} \tag{2}$$

is well-posed and such that solutions of the well-posed problem (2) approximate known solutions of the original ill-posed problem (1). We use C-regularized evolution systems to obtain our approximation which establishes continuous dependence on modeling for the problems under consideration. Namely, assuming $u(t)$ and $v(t)$ are solutions of (1) and (2) respectively, we prove that

$$\|u(t) - v(t)\|_1 \leq C_1 \beta^{1-\frac{t}{T}} M^{\frac{t}{T}}$$

for a suitable norm $\|\cdot\|_1$, where $0 < \beta < 1$, and C_1 and M are constants independent of β. (Received September 21, 2009)