Meeting: 1004, Bowling Green, Kentucky, SS 7A, Special Session on Semigroups of Operators and Applications

1004-35-139 **Irena Lasiecka** and **Roberto Triggiani*** (rt7u@virginia.edu), Department of Mathematics, Kerchof Hall, University of Virginia, Charlottesville, VA 22904. *Sharp uniform decay rates at the L2-level of the Schrodinger equation with non-linear boundary dissipation.* Preliminary report.

We prove that the Schrodinger equation defined on a multidimensional bounded open domain and subject to a certain physically attractive non linear boundary feedback is (well-posed in L2 as a non-linear semigroup and, moreover) stable on L2, with sharp (optimal) rates of decay. Uniformity is with respect to all initial conditions contained in a given L2-ball centerd at the origin. The boundary conditions involve the normal derivative and the Dirichlet trace of the solution. A key new aspect of this result is that the aforementioned boundary dissipation yields decay in the desirable and sought-after L2-topology, unlike prior results in the literature. To achieve this, inverse-type energy-estimates in L2 are needed, while natural estimates for Schrodinger equations are in H1. No assumptions on the behavior of the non-linearity near the origin are required, though this behavior determines the actual decay rates. An explicit contructive algorithm is given to compute the decay rates. (Received January 22, 2005)