1062-35-207 **Gregory C Verchota*** (gverchot@syr.edu), Dept. Mathematics, 215 Carnegie Bldg., Syracuse University, Syracuse, NY 13244. *A linear elliptic operator without coercive Neumann problems in a convex domain.*

A linear homogeneous 4th order elliptic differential operator L with real constant coefficients and a bounded nonsmooth convex domain Ω are constructed in $\mathbb{R}^6$ so that L has no *coercive* integro-differential quadratic form over the Sobolev space $W^{2,2}(\Omega)$. Thus each variational Neumann problem for the homogeneous equation $Lu = 0$ in Ω lacks a bilinear form meeting the principal hypothesis of the Lax-Milgram theorem. When any quadratic form associated with L is placed on the boundary the resulting Rellich identity fails to control all 2nd derivatives of solutions in $L^2(\partial\Omega)$. Among the Neumann problems for L are those that are regular in the sense of Agmon-Douglis-Nirenberg in smooth domains. Each of these regular self-adjoint problems fails to be semi-bounded in the convex domain Ω, thus failing a sufficient condition for the Neumann eigenvalues to be contained in a half-line. (Received August 09, 2010)