1065-35-120 **Irena Lasiecka*** (il2v@virginia.edu), Department of Mathematics, University of Virginia, Charlottesville, VA 22901, and **Barbara Kaltenbacher**. *Well-posedness and exponential decay for the quasilinear Westervelt equation arising in modeling of high intensity ultrasound.*

Global solvability of Westervelt equation, which model arises in the context of high intensity ultrasound HIFU. The PDE equations derived are evolutionary quasilinear, potentially degenerate damped wave equations defined on a bounded domain in $R^n, n = 1, 2, 3$.

We prove local and global well-posedness as well as exponential decay rates for the Westervelt equation with *inhomogeneous Dirichlet boundary conditions* and small Cauchy data. The local existence proofs are based on an application of Banach's fixed point theorem to an appropriate formulation of these PDEs.

Global wellposedness is shown by exploiting functional analytic properties enjoyed by the semigroups generated by strongly damped wave equations. These include analyticity, dissipativity and suitable characterization of fractional powers of the generator -properties that enable the applicability of the "barrier" method .

The obtained result holds for all times, provided that the Cauchy data are taken from a suitably small (independent on time) ball characterized by the parameters of the equation, and the boundary data satisfy some decay condition. (Received September 08, 2010)