1113-35-107 **Irena M Lasiecka*** (lasiecka@memphis.edu), Department of Mathematical Sciences, University of Memphis, Dunn 373, Memphis, TN 38120, and **Xiaojun Wang**, Department of Mathematics, Stillwater, OK. *Uniform stability for Moore-Gibson-Thompson (MGT) equation with memory arising in High Frequency Ultrasound (HIFU).*

We consider MGT equation arising in modeling of High Frequency Ultrasound technology. The model accounts for a finite speed of propagation of acoustic waves which results from the application of Catteneo's Law rather than the usual Fourrier 's Law in describing heat conduction. This leads to a third order in time equation with a heat relaxation parameter $\tau > 0$. In addition to the heat flux relaxation, molecular relaxation is accounted for. The latter results in adding memory term with a dynamic relaxation kernel described by a rather general decreasing function $g(t)$. Questions related to well-posedness and uniform stability of the resulting third order dynamics with a memory are discussed. .

In particular, it will be shown that the dynamics can be uniformly stabilized through molecular relaxation only and without any mechanical dissipation. Quantitative description of stability is given by providing optimal decay rates for the energy where the latter reflect the rates of decay of molecular relaxation. (Received August 14, 2015)